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ROTUNDA

the magazine of the Royal Ontario Museum





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ROTUNDA

the magazine of the Royal Ontario Museum

Volume 15, Number 1, Spring 1982

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Honor de Pencier

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Governor General of Canada

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Robertson, Photography Department, ROM)

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Rotunda Price Change

We are sorry to have to announce that, because of continually rising costs, we
are obliged to raise the price of *Rotunda*. An annual subscription (4 issues) will
now cost \$8.00 and single copies will cost \$2.50. Paid-up subscriptions will be
honoured at the old rate until they become due for renewal.

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Editorial

"The times change and we change with them"—this anonymous observation, cited by a 16th-century English chronicler, could well be taken to epitomize what has been happening at the Royal Ontario Museum in recent years. At some of the more exasperating moments during this period, some may even have been tempted to feel that the spirit of the times was more accurately caught by Heraclitus's famous dictum, "Everything is in a state of flux; nothing stays put."

Members of the Museum, of course, are well acquainted with the scope and nature of the changes taking place; and anyone who has negotiated the intersection of Avenue Road and Bloor Street in midtown Toronto during the last two or three years could hardly fail to be aware that something pretty momentous is happening. But for those of our readers who live at a distance and who neither have been able to view the goings-on for themselves nor have received regular reports on them, a brief account may be helpful.

The ROM's Renovation and Expansion Project, after many years of discussion, moved from the planning stage to implementation in 1978. It embraces three phases, at a cost of well over \$50 million. The first phase, already completed in 1981, was the construction of a nine-storey Curatorial Centre, which houses in its 25 455 gross m² of floor space most of the offices, laboratories, storage areas, and facilities required for the operation of the Museum and its many and varied programmes. The second phase, due to be completed in the summer of 1982, is the total renovation and reconditioning of the original building; and the third, also nearing completion, is the construction of the Terrace Galleries Building with its 10 033 gross m² of new gallery space.

The words "Renovation and Expansion", however, do not tell the whole tale. The new Museum will be very much more than an enlarged and reconditioned version of the old one. Implicit in the whole project are new imaginative and creative concepts of what a museum can be and can do. This is not the occasion for enlarging on these concepts. In future issues of *Rotunda*, some of the people responsible for developing and realizing them will be doing this in some detail. Meanwhile, in keeping with the trend, the staff of *Rotunda* have also been making plans for change, the better to reflect the new, modern Museum which it is one of the functions of the magazine to project.

The first outcome of this planning is immediately evident in the larger format and redesigned typography and layout of this current issue. The new design is the work of three members of the ROM's Publication Services Department—Alyson Hannas, Jean Lightfoot, and Francesca Terrell. But this is only a beginning; in addition to providing a more versatile layout, the new design is intended to facilitate further innovations in future issues.

One of the proposed changes requires the participation of our readers. From time to time some of you have written to us to comment on the magazine or on one or other of the topics discussed by our authors. Such feedback from readers is not only most welcome but is also of the greatest usefulness in helping us to gauge what people would like to see in the magazine. Now, when change and innovation are in the air, readers' comments and suggestions will be more welcome than ever. If the response warrants it and if it is thought that letters received would be of interest to our readers in general, a selection of the letters will be printed as a regular feature of the magazine.

Exciting prospects lie ahead for the whole Museum. At a time when the future in so many directions is being made to look problematical and even bleak, the potential of the renovated and expanded Museum is, by contrast, something to fire the imagination. When the first issue of *Rotunda* appeared in 1968, just before the separation of the ROM from the University of Toronto, the then managing editor wrote: "*Rotunda* appears as the Museum faces a period of change, renewal, and expansion which it hopes will claim the interest and support of the many people who regard it with pride and affection." Now that we are nearing a stage in the process that might be called the end of the beginning, *Rotunda*, like the rest of the ROM, can move confidently forward into the next phase fortified and encouraged by the knowledge of what has already been accomplished.

J.S.C.



Fourteen years of *Rotunda* covers. From Volume 11 forward, back issues are available from Publication Services, ROM.
Photo: Brian Boyle, ROM

Early Treasures

*The John and Eustella Langdon
Collection of Canadian Silver*

Honor de Pencier



John Emerson Langdon (1903–1981),
for many years the leading authority on
Canadian silver, examining pieces of
early flatware.

An important collection of early Canadian silver belonging to the late John Emerson Langdon of Toronto is being given to the Royal Ontario Museum. The collection includes more than 500 pieces bearing the marks of 150 silversmiths and dealers who worked in Quebec, Ontario, and the Maritimes in the 18th and 19th centuries. Together with an earlier gift of sixty items presented to the ROM in 1952, the John and Eustella Langdon Collection of Canadian Silver forms a unique record of almost all the marks of the early silversmiths of Canada and is one of the most comprehensive study collections on this subject. It has been certified as nationally significant by the federal Cultural Property Review Board and is on loan to the Canadiana Department until it is formally transferred to the Museum as a gift.

John Langdon had a long association with the ROM and was a member of the Board of Trustees from 1968 to 1972. He was particularly interested in objects from Canada's past that illuminate the country's cultural and social history. His gifts to the Canadiana Department over the years, which include a magnificent collection of early woodenware, as well as prints, furniture, and pottery, reflect this interest.

It was in the field of early Canadian silver that John Langdon became the foremost expert, studying and collecting for more than fifty years. His four books, published between 1960 and 1970, and many articles on the subject are the result of years of meticulous research, analysis, and documentation. All this he achieved in his spare time, for Mr. Langdon was also distinguished in the Canadian financial world. In 1928 he became the editor for eastern Canada of the *Financial Post*, with headquarters in Montreal. He moved in 1950 to Toronto with the investment house of McLeod, Young, Weir, of which he became a vice-president and director in charge of corporate finance.

John Langdon's interest in silver began in the 1930s, when, in a search for pewter, he discovered a silver spoon stamped "MONTREAL". While making enquiries about the date and maker of the spoon, he learned that religious and domestic works of silver had been made extensively in Canada from the earliest days.

Curious for more information, John Langdon began a quest for examples of early Canadian silver in Quebec, Ontario, the Maritimes, the United States, and eventually in France and Britain. With imaginative persistence he pur-



Presentation mug, possibly a christening present, mid-19th century, mark of W. C. Morrison, Toronto (Ht. 7.3 cm).



Navette, or incense boat, in a traditional French style, late 18th or early 19th century, mark of François Ranvoyzé, Quebec (Ht. 6.5 cm). The spoon is probably of a later date, and is unmarked.



Top, from left to right: Pair of sauce ladles, mid-19th century, mark of A. S. Hay, Saint John, N.B. (L. 18.5 cm); pickle fork, late 19th century, mark of Finlay Sim, Saint John, N.B. (L. 21.9 cm); meat skewer, late 19th century, mark of J. E. Ellis Co. Ltd., Toronto (L. 37 cm); marrow spoon, mid-19th century, mark of Christian Grothe, Montreal (L. 23.3 cm); dinner spoon of Old English style, with bright-cut engraving, late 18th or early 19th century, mark of John Booth, Saint John, N.B. (L. 24 cm); pair of salt spoons, mid-19th century, mark of Richard Kestell Oliver, Toronto (L. 9.1 cm).

sued every chance lead in his painstaking search for information on indigenous silver and its makers. He pored over directories, records, and documents in archives and institutions large and small, well known and obscure. Ancient papers were proudly produced in old parishes where for decades no one had bothered to look at the silver or to ask questions about its origin.

This search was taking place at a time when Canadian antiques, and silver in particular, were not of general interest. Although John Langdon's discoveries of early silver are highlighted by rare and beautiful pieces—sometimes rescued from the melting pot—it was not the number, style, or size of the specimens that was significant. The prime purpose of his efforts was to collect makers' marks. As spoons were the most commonly made items, these and other table utensils make up the bulk of the collection. Generally damaged, worn, and tarnished, flatware was often disregarded by dealers as being dull; it was therefore inexpensive. To John Langdon, armed with a growing instinct for and knowledge of Canadian silver, these bargains became treasured links in his collection. Gradually he assembled a representative collection of silver from 1700 to 1900, with almost every known maker identified by one or more of his marks. This was John Langdon's achievement; it is one that would be impossible to duplicate today.

The Langdon Collection came to Toronto through the persuasiveness of the late Mr. F. St. George Spendlove, then curator of the Sigmund Samuel Collection of Canadiana at the ROM. When he visited the Langdons in Montreal, he pointed out to them that since Canadian silver was available for study

throughout the province of Quebec, as well as in Montreal and Ottawa, it seemed appropriate to place their collection in another region. Mr. Langdon subsequently gave his large reference library of books and pamphlets on silver, and his research papers, to the Thomas Fisher Rare Book Library of the University of Toronto. With his gifts of silver to the ROM, Toronto now provides an outstanding centre for further studies in early Canadian silver.

The items in the collection reveal the categories of silver articles that would have been ordered from local silversmiths in the early days. The requirements of a small population for household silver alone would never have promoted the art of the silversmith, who continuously faced competition from imported goods—French at first, later British. It was the need of the Roman Catholic Church for silver vessels that helped establish the craft in Canada in the early part of the 18th century. Also, about mid-century, fierce competition for the valuable fur trade arose; the popularity of silver ornaments as trade goods among the woodland Indians gave silversmithing a healthy boost. As this unique trade phenomenon lost its impetus at the beginning of the 19th century, continued church patronage, a growing population, and changing table customs helped to keep the silversmith in business.

Two *navettes*, or incense boats, in the Langdon collection illustrate that church silver in Canada was made according to traditional French styles. One example, of the highest quality, is by the famous François Ranvoyzé (1739–1819), who worked in Quebec. Small and well-proportioned, the *navette*, with its main decorative motif of acanthus leaves on a matte ground, re-



flects the best of this master's embossing technique and his tasteful interpretation of classical motifs. A slightly larger *navette*, of a less ornate, fluted design, is also a fine piece; unfortunately its maker is unknown.

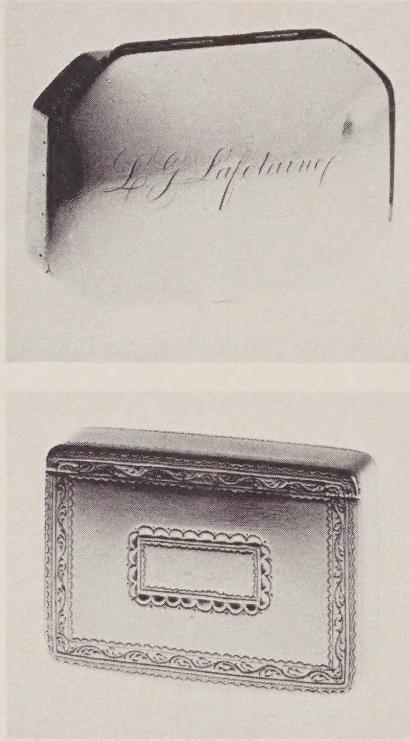
François Sasseville (1797–1864) of Quebec created a pair of *burettes*, or cruets, of pear shape with a band of reeding at the collar. These were used as containers for wine and water in the service of mass. A small oval tray with a scalloped rim by Michael Arnoldi (1763–1807) of Montreal was perhaps for holding *burettes*. A tiny, elegant baptismal pot came from the famous silversmithing establishment of Pierre Huguet, called Latour, also of Montreal, in business from about 1771 to 1829. Six reliquary crosses of different styles and by different makers provide further opportunities for the comparison of varying tastes in design of religious silverware.

Changing styles in silverware are also reflected in domestic silver. Mr. Langdon's collection of tumbler cups, or *petits gobelets*, indicates a type of small



Above: Nutmeg grater, mid-19th century, mark of Nelson Walker, Montreal (Ht. 11.1 cm).

Left: Tableware of the 18th century in typically French styles. From left to right: wine taster, mark of François Ranvoyzé, Quebec (Diam. 8.4 cm); tumbler cup, marked MG, attributed to Jacques Gadois, called Mauger, Montreal (Ht. 5.5 cm); oval wine taster or dish, mark of François Ranvoyzé (Diam. at widest part: 11.6 cm).



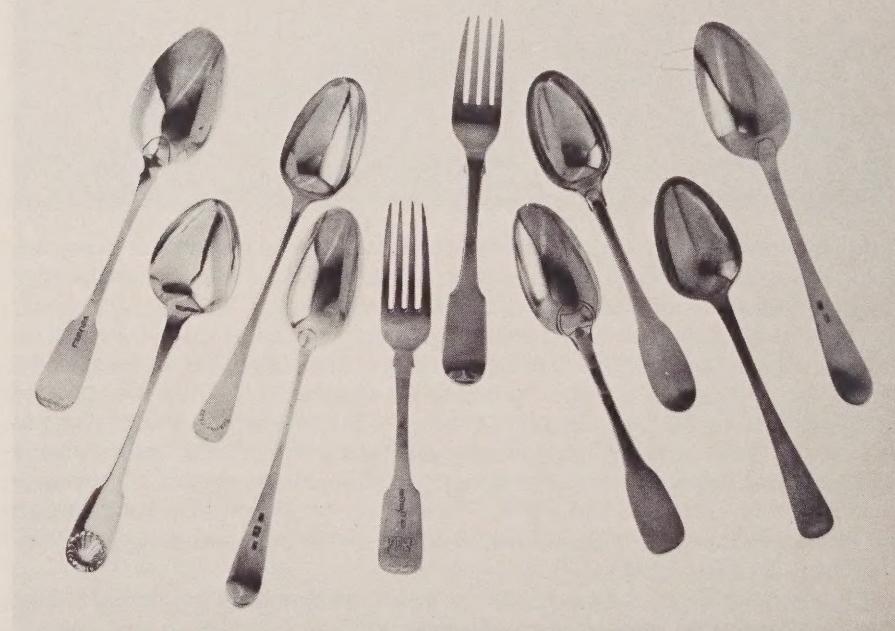
Snuff boxes: top, late 18th or early 19th century, mark of Laurent Amiot, Quebec (L. 8.3 cm); bottom, early or mid-19th century, mark of François Sasseville (L. 7.6 cm).

drinking cup popular in New France. The form first appeared in the 17th century. It has various features that associate it with travelling, perhaps even in a swaying coach; the cup is simple in style, with a rounded and weighted base, so that when it is tilted, it rights itself. Also, the sides of the cup are usually slightly flared and without handles, enabling them to be packed in nests. Three makers of these tumbler cups are among the earliest silversmiths in Canada: Jean-François Landron (1686–1762?) and Joseph Maillou (1708–1794), both of Quebec, and Jacques Gadois, called Mauger, (1686?–1750) of Montreal. Two later makers from Montreal are also represented, Jacques Varin and David Bohle, both active in the late 18th century. Another common early style of silver drinking vessel in the collection is a plain, smooth-sided, flat-based beaker made by Laurent Amiot (1764–1839), who replaced François Ranvozé as Quebec City's most popular silversmith towards the end of the 18th century; Amiot introduced new French styles and techniques for religious and domestic silver articles upon his return from Paris in 1787.

Two wine tasters by Ranvozé are made in early French styles. One is small and plain; the other is of oval shape, its principal decoration being wide gadroons around the bowl below a band of dots; both have the same applied shell motifs as thumb-rests with finger-rings underneath. Later when snuff-taking was fashionable, small snuff boxes were created by Ranvozé's successors Amiot and Sasseville. The earlier box in the collection, by Amiot, is plain, smooth, and rectangular, with canted corners; the lid and base are slightly convex, and inscribed in script on top of the lid is the name "L.G. Lafotaine". Amiot's apprentice, friend, and ultimately, his successor in the mid-19th century was Sasseville. He fashioned another box, also rectangular, with a gilt interior and finely engraved borders of neoclassical designs on the lid and sides. An attractive nutmeg grater, made in Montreal during the same period by Nelson Walker, has a handle at the top formed by a shell flanked with acanthus leaves.

Among presentation items in the collection are christening mugs, napkin rings, and a delightfully simple, well-proportioned cup dedicated by the Montreal Florist Society to Mr. John Teasdale for producing the best polyanthus in 1812. This is the work of Salomon Marion, an apprentice of Pierre Huguet and one of the great silversmiths of the 19th century. A later presentation trowel, made by Jodah G. Joseph and Company of Toronto, commemo-

From left to right: Pair of spoons, mid-19th century, mark of Peter Nordbeck, Halifax (L. 22.5 cm); pair of spoons, late 18th century, engraved *Barons Club*, attributed to John Lumsden, Montreal (L. 22.6 cm)—the Barons' Club, according to John Lambert who attended one of its gatherings; in Quebec in 1808, was made up of 21 "principal merchants in the colony" who called themselves barons and organized convivial gatherings; pair of forks, mid-19th century, mark of Christian Grothe, Montreal (L. 23 cm); pair of spoons, late 18th century, mark of Jacques Varin, Montreal (L. 20.5 cm); pair of spoons, late 18th or early 19th century, mark of Laurent Amiot, Quebec (L. 22.3 cm).





Above: Link bracelet made up of typical trade silver brooches in general use from about 1760 to 1820 and the types of coins from which they were made. From left to right: a buckle brooch; a damaged Spanish coin bearing the name of Carolus III; a star-shaped brooch; another Spanish coin dated 1749; a Luckenbooth-type brooch; a George II coin from Britain; and a buckle brooch, matching the first. On the reverse of the George II coin are engraved the initials *GT* and *EP* above and below a heart. No marker's mark is visible. (Size of coins and brooches varies from about 2 cm to 2.5 cm in diameter.)



Left: A pair of *burettes*, or cruettes, containers for wine and water in the service of mass, marked *A* for aqua, and *V* for vino, early or mid-19th century, mark of François Sasseville, Quebec (Ht. 13 cm).

rates the laying of the cornerstone of the Primitive Methodist Church, Parliament Street, Toronto, on 11 July 1871.

John Langdon also collected ornaments, known as Indian trade silver, made for the fur trade between 1750 and 1820. Good examples of the most popular buckles, brooches, ear-bobs, wristbands, and crosses are supplemented by two more unusual "spoon" lockets, plain in front, but delicately engraved on the back. One is marked by Robert Cruickshank of Montreal, whose workshop seems to have produced the greatest amount of Indian trade silver during this period. The most intriguing item, however, is a linked bracelet of seven pieces—four popular trade-brooch forms interspersed with three coins. The bracelet illustrates both the type of coin in circulation at the time and examples of ornamental forms that were made from similar coins. Silver was in short supply in the 18th century, and silversmiths relied on coins and obsolete silver objects for their raw material.

Later miscellaneous items in the collection include a hairpin, a small box, and decanter labels, all of plain design. In contrast to these simple articles is a pair of small ornate Victorian posy-holders composed of embossed and cut-out beavers, leaves, and branches, all intricately joined and highlighted with bright-cut engraving. Shaped like a cone, each holder has a pin attached to a chain to keep the flowers in place and a finger-ring for extra security. Posy-holders are sometimes described as alternatives to the fan, a popular 19th-century accessory. They are usually unmarked.

Flatware, the largest category in this collection, not only records the greatest number of people who worked in silver but also reflects changes in Canada's social history. The basic table utensils of New France were dinner spoons and forks and large ragout spoons. All examples from this period are of considerable weight and of the same handsome, plain design; variations occur in such details as the decorative drop on the back of the bowl. As in French silver of this period, the owner's initials were often engraved on the back, since the custom was to lay the spoons and forks face down on the table.

In the second half of the 18th century, changes in eating and drinking habits coincided with the arrival in Canada of British and European immigrants familiar with the new styles abroad. The silversmiths of Montreal and Quebec, whether of Canadian or European origin, began to produce flatware in the new popular Old English and Fiddle styles. Tea and other innovations called for entirely new forms in silver, such as teaspoons and sugar tongs. Other spoons were specially made for mustard, salt, eggs, and even tabasco. Small ladles for sauces or gravy, and others with pierced bowls for sifting sugar, appeared. Strikingly plain meat skewers and a marrow spoon in the collection contrast with elaborately engraved fish slices with open-work designs on the blades to let the extra juices run off. Late Victorian butter knives,



Above: Makers' marks. Top to bottom: Pierre Huguet, Montreal, late 18th or early 19th century; Robert Cruickshank, Montreal, late 18th century; Laurent Amiot, Quebec, late 18th or early 19th century; Peter Nordbeck, Halifax, mid-19th century; Robert Hendery, Montreal, mid-19th century.

Right: Makers' marks. Paul Lambert, Québec, early 18th century; Jacques Varin, Montréal, late 18th century.



smaller versions of the fish slices without the piercing, were also decorated with engraved designs.

Silver from the Maritimes provides attractive variations in style and pattern. Shell motifs, coffin-ends, or other decorative features such as bright-cut engraving appear often in flatware from this area. British and American influences are generally more strongly reflected in the silversmiths' work of both the Maritimes and Ontario than of Quebec. Stylistic features in silver produced in different areas are important in establishing places of origin, dates, and makers' marks; some of these marks are very rare and others are yet to be identified. These varied styles and patterns also provide valuable social and artistic information for a more complete interpretation of the work of the early silversmiths.

By the middle of the 19th century the demands of an increasing population and technical innovations in the silver industry around the world changed the role of the silversmith. No longer able to compete as an individual craftsman in the face of mass production and inexpensive silver-plated wares, he often became a "maker to the trade", producing silver objects for dealers; sometimes he went into the retail business, selling the work of others. Since the dealer's mark usually appears on silverware, in many cases it is difficult to determine the maker of the piece. The best-known maker to the trade in the last half of the century was Robert Hendery, whose Montreal workshop produced silverware for more than one hundred dealers across Canada. These companies and their identifying symbols were published by John Langdon, and most are represented in the collection.

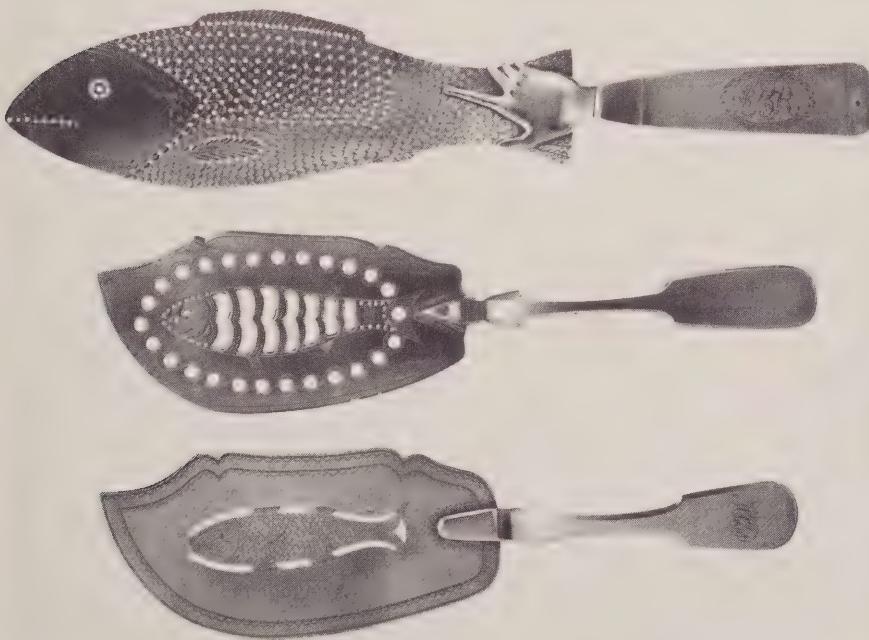
Mr. Langdon's death is a great loss to all students of Canadian silver. He was a doer, whose keen sense of investigation combined with the energy and persistence to follow a lead through to its end, made him the expert in his field. His efforts have resulted in a great and vital contribution to Canada's heritage.

Selected References

- Derome, Robert. *Les orfèvres de Nouvelle-France*. Ottawa, 1974.
Fox, Ross Allan C. *Quebec and related silver at the Detroit Institute of Arts*. Detroit, 1978.
Langdon, John E. *Canadian silversmiths 1700–1900*. Toronto, 1966.
Trudel, Jean. *Silver in New France*. Ottawa, 1974.



Honor de Pencier joined the ROM in 1977 as a curatorial assistant in the Canadiana Department. Born in Winnipeg, she graduated from the University of Manitoba, and taught school in Toronto after attending the Ontario College of Education. Her first association with the ROM was in 1966, when she catalogued books in the Sigmund Samuel Collection. After working with the Members' Committee for six years, she returned to the University of Toronto to study fine arts; early Canadian silver, prints, and paintings are her special research interests.



Fish slices. Top to bottom: attributed to Henri Polonceau, Montreal, late 18th or early 19th century (L. 38 cm); mark of François Delagrange, Quebec, early 19th century (L. 31.5 cm); mark of Joseph Robinson & Company, Toronto, late 19th century (L. 27 cm).

Photos: Brian Boyle, ROM, except p. 11, top,
Bill Robertson, ROM

There take that and that and that,
and be carefull not to provoke my Ginger more.

It forgive me thus time and I ne
will do so again, oh dear oh de
you'll entirely spoil the *Icon*
of the Sitting.



“Let Satire Be My Song”

English Caricatures 1780–1830

Mary de Brisay Campbell

Many years ago, when the Museum was young, it acquired three large tomes of caricatures. Their provenance is, alas, unknown; whether they were a gift or a purchase is a question whose answer is lost in the mists of time. Not even the oldest inhabitant can remember the facts about them, though the books themselves are distinctly remembered.

The pages on which the prints are pasted are 60 cm high by 46 cm wide, and most bear the stamp “CRAYON PAPER/FAST COLOURS/CRESWICK”. They are buff, brown, or grey in colour, and are gilt-edged; since it is unlikely that crayon paper was sold with a gilt edge, the gilding must have been done at the time of binding. Most of the prints are mounted two to a page, either one above the other or side by side, but some of the smaller ones in Volume III are arranged four or more on a page. This form of storage is not ideal; even the most careful handling is apt to break the crayon paper.

The man who collected the caricatures had a passion for neatness: he seems to have ruled a page to leave nice margins, and then cut the prints to fit his measured space, so that often the date and the place of publication are lost. The task of identifying the people portrayed would have been easier if each print had been mounted alone on a board, so that those dealing with the same persons or events might be examined together; but until the Conservation Depart-



DANDIES and DANDYZETTES.

Opposite page: Britannia correcting an unruly boy (Napoleon), unsigned, 13 June 1803. (23.4 cm × 32.4 cm)

Fashion in 1818, Isaac Cruikshank, 6 November 1818. (32.2 cm × 22 cm)

Forerunner of the bicycle, I.R.C. fecit,
1819. (23.7 cm × 15.5 cm)



ment has a paper expert with time on his hands the prints must remain where they are, bound between heavy boards covered with mottled paper and with black leather spine and corners.

The majority of the prints are etchings on wove paper, hand coloured. Of 992 prints only 26 are duplicates, and of those sometimes one is coloured and the other plain. There are prints by all the Cruikshanks, by Rowlandson, Heath, Gillray, Williams, Woodward, and several by someone who signs himself Giles Grinagain. Most have a political connotation, though sometimes its significance is lost to us. All the important figures of the time, with their crotches and foibles, are paraded before us. William Pitt the Younger, with his tip-tilted nose on which he was said to hang the House of Commons, was a godsend to the artists. He is unmistakable, and though many of the prints show rancour and hatred for him and all his works, there is never lacking an air of boyish uprightness in the spare figure, and an expression of cheerful optimism on his face. When he died in 1806, Isaac Cruikshank depicted the event in a schoolroom, the devil flying off with Pitt, George III as schoolmaster bemoaning the loss of one of his monitors, and the caption reading "The father of a large family taking his eldest son out of school". But a print attributed to Rowlandson, so tall that the page can scarcely contain it, is a profile figure of Pitt entirely painted in green, with the simple caption "An Ever-Green".

Many prints show Pitt with his friend and staunch supporter Henry Dundas, later Lord Melville. When Dundas was accused of embezzling Navy funds Pitt felt it keenly, and some thought his early death was hastened by his friend's impeachment. Dundas was later acquitted, an event celebrated in a print which shows him throwing bricks at a group that includes Charles James Fox and Richard Brinsley Sheridan, the latter better remembered as a playwright than as an M.P. The sun above shows the head of George III.

Many of the great political issues of the day are reflected in the caricatures. Several depict the Union of England and Ireland—one of these shows Pitt as a Presbyterian minister calling the banns. Some deal with the abolition of the slave trade, others with the reform of Parliament, and many with Catholic Emancipation, a subject that frequently came to the fore in the reign of George III. However much support the Catholic Emancipation Bill gained in both Houses of Parliament, the king with his characteristic stubbornness always opposed it vehemently. It proved a stumbling block to Pitt, who espoused the cause in 1801, and for the only time in his career was forced to resign. The bill

did not become law until years later, in the reign of George IV. The Reform Bill of 1832 and the bill for the abolition of slavery of 1833 were both passed into law under William IV, and the Museum has a brass medal commemorating William and these two achievements of his reign.

Not all the prints are political; some deal with fashion and entertainments. The clothes worn by fashionable people in 1818 must be seen to be believed—surely the pictures of them are true caricatures. That was the year when everybody was riding a "hobby", the forerunner of the bicycle. The machine had no pedals; the rider simply sat on the frame and walked or ran. Both men and women are shown rushing over the countryside on hobbies. "Skaiting" was evidently a popular sport. Many prints show country fairs and race tracks.

Actors and the theatre are favourite subjects, and a print of 1786 shows Mrs. Siddons in a scene from *The Critic*. The famous John Kemble appears in many, and two show him being overshadowed by "The Young Roscius". This was



Above: Bronze medal commemorating "The Young Roscius", 1804. (4.2 cm in diameter)

Left: General Wellesley portrayed as a coward, unsigned, 1808. (21.7 cm × 31 cm)



General Whitelocke dishonoured, Isaac and/or George Cruikshank, 20 March 1808. (33 cm × 22.2 cm)

William Henry West Betty, who played *Hamlet* in Dublin at the age of twelve to such purpose that he was brought to London, where he had a successful career. At eighteen he thought he should complete his education, and went to Cambridge. When afterwards he tried to return to the stage, the public had entirely lost interest in him, and he retired to live in comfort on the proceeds of his six years in the theatre. The Museum has a bronze medal by Thomas Webb of Birmingham commemorating his career.

Several of the prints depict the plight of Lt. General John Whitelocke, who was sent with an expedition to recover Buenos Aires in 1808. Not only did he fail to do so, but he also lost Montevideo, and was cashiered. One print shows a siege, and on several parts of the print appear the words "Where is the General?" Another shows a soldier breaking Whitelocke's sword over his head. Still another shows a group of officers raising their glasses to the toast, "Grey hairs but no Whitelockes".

French politics commanded the interest and attention of most Englishmen when the first stirrings of revolution made themselves felt in France. Opinion was, however, sharply divided. To many Englishmen the Revolution represented an unwelcome rocking of the boat, but many others, led by Fox and his friends, were intensely enthusiastic. When Fox heard of the fall of the Bastille, he is said to have exclaimed, "How much is this the greatest and best event that has happened in the world!" As things across the Channel were seen to worsen, he and his followers were dubbed Jacobins. Another enthusiast, Tom Paine, revered by Americans for his book *The Rights of Man* (London 1791), is shown in one caricature as inspired by the devil himself. Joseph Priestley (1733–1804), a scientist as well as a Nonconformist parson, sympathized with the ideas behind the French Revolution and was harried to such an extent that he and his family fled to the United States. William Cobbett (1766–1835), a writer, publisher, and Member of Parliament, was another who believed that the Revolution, de-

Skating, Gillray, 24 November 1805.
(33.3 cm × 22.2 cm)



Pitt going to open the budget, Isaac Cruikshank, 28 November 1796. (30.5 cm × 23.5 cm)



spite the evils and the terrors it spawned, was a source of world improvement. Cobbett was prosecuted for his views, was jailed on both sides of the Atlantic, and spent much of his life in flight.

The royal family is well represented: George III and Queen Charlotte, the Prince of Wales and all his mistresses, the Princess of Wales and all her troubles, Princess Charlotte and Prince Leopold, and William IV and Queen Adelaide. Frederick Duke of York, the second son of George III, was his father's favourite son. As a baby he was invested with the wealthy bishopric of Osnabrück. In his twenties he married a suitable German princess, but he and his duchess did not



Above: *An Ever-Green*, attributed to Rowlandson, 1806. (11.6 cm × 51.8 cm)

really get on, and she retired to their country home and collected dogs, of which she was very fond. When war broke out in Europe, Frederick was named Commander in Chief. Frederick's mistress, Mary Ann Clarke, was a pretty little woman with a head for mathematics. In 1809 it was discovered that people who sought the duke's help for advancement in the army, the Church, or in any walk of life were approaching Mrs. Clarke with bribes to gain his favour. The scandal lost Frederick his command, and he was brought home. As a commander in the field he had not really shone, but when at the king's insistence he was reinstated and given a staff job, he proved to have very good ideas and carried out a number of very necessary reforms in the army.

It is startling to find General Wellesley (later the Duke of Wellington) held up as a coward, but that is the message of one of the prints. In 1808 he had beaten the French soundly in Portugal at the battle of Vimeiro, and he was prepared to press on and keep them on the run. Just then Sir Harry Burrard arrived to take





Opposite page, right: Mary Anne Clarke, Dr. O'Meara the Irish bishop, and the Duke of York, Isaac Cruikshank, 25 February 1809. (22.5 cm × 30.2 cm)

Left: Dundas acquitted, unsigned, 24 June 1806. (34.9 cm × 23.6 cm)

over the command; he was superseded almost at once by Sir Hew Dalrymple. Both the new arrivals were generals of the old school, and though Castlereagh had urged Dalrymple to take advice from Wellesley, he refused to listen to a young cub. Instead, the French army was permitted to withdraw to France with all its transport and property—much of it loot. So Wellesley's victories were thrown away, and the French lived to fight another day. News of the victories reached England only after people had heard about the favourable terms to the French, and the public was enraged. Wellesley, who had signed the Convention of Cintra at the bidding of his seniors, found when he arrived in England that he was execrated as much as they. Quite unperturbed, he visited his constituency in Ireland and went quietly to work there.

The caricatures in the collection were issued by a number of publishers. Isaac Cruikshank dealt with S. W. Fores almost exclusively, and 504 prints in our collection were published at the three addresses in Piccadilly consecutively occupied by Fores—probably more, since the publisher's name and the date have been cut from many, as mentioned above. Gillray and Rowlandson published through Thomas Tegg in Cheapside. How many prints were made from one plate it is impossible to say. One of ours is illustrated in Grego's catalogue of the Rowlandson caricatures with the note "21 shillings per hundred plain, 2 guineas per hundred coloured". Many of our prints, on the other hand, are marked "Price one shilling coloured". Many too are inscribed "Folios of caricatures [sic] lent out for the Evening". So it must have been a favourite ploy in club and coffee house to pass these pictures around while blowing a cloud. Posted in a publisher's window or on street corners, the caricatures could be enjoyed by those too poor to buy them.

And the purpose of all these pictures? For centuries public figures have been lampooned in one way or another, and this was a perfect medium. In *English Bards and Scotch Reviewers* (5) Lord Byron wrote, "Fools are my theme, let satire be my song." Most of the prints harp on the failings and foibles of their subjects and are sharp and often cruel criticisms. A few, on the other hand, are eulogies, like the one of Pitt mentioned above.



Mary de Brisay Campbell was born in Ste-Agathe-des-Monts, Quebec. She was educated at the Bishop Strachan School and Trinity College, Toronto, and came to the Museum in 1939 as an assistant to Dr. Currely's assistant. In 1941 she became secretary to Dr. Currely until his retirement in 1946. She was secretary to Mr. Brett and to Dr. Tushingham in the Main Office of Archaeology until 1960, when she moved to the European Department as department secretary. Since 1978 she has been a research assistant.

Photos: Brian Boyle, ROM, except p. 19, right, Bill Robertson, ROM

A Sound Move

*Conservation Preparations for
a Musical Instrument Loan*

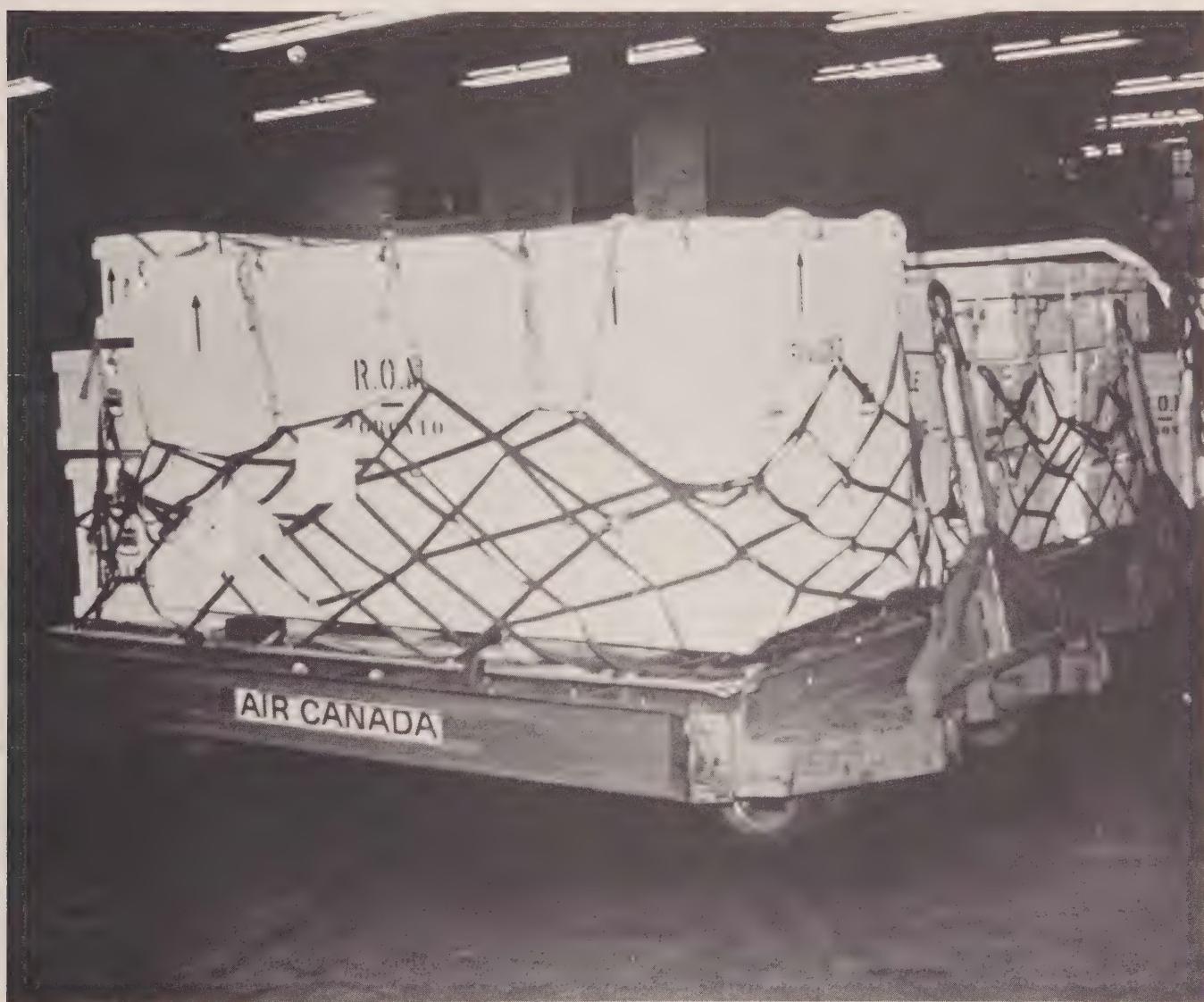
Susan Wilson

The Gasparo da Salo double bass. The glass-plate negative from which this print was made is one of the oldest in the Museum's collection.

After spending two years in Vancouver, 24 musical instruments from the European Department of the Royal Ontario Museum will return home in April 1982. The instruments were there as part of "The Look of Music", a spectacular international exhibition of Western instruments made between 1500 and 1900, which ran from 2 November 1980 to 5 April 1981 at the Vancouver Centennial Museum. Although the loan of objects to other institutions is an important and rewarding museum function, none is ever lightly undertaken, because each, to be successfully accomplished, may occupy many people from many departments for considerable lengths of time. The Vancouver loan made such demands. However, because this loan provided the opportunity to make lasting repairs on several of these instruments years earlier than planned, from a conservation standpoint the effort was fully repaid.

It is not practical to make elaborate repairs to any object unless they are going to endure, and repairs to sensitive wooden artifacts will last only in an environment with stable relative humidity. Because such an environment was unavailable for the musical instruments in the unrenovated Museum galleries, extensive repairs to these artifacts had been postponed. The request from the Vancouver Centennial Museum for a loan of instruments was particularly attractive to the Conservation Department for two reasons: the VCM had a well-controlled environmental system that kept the relative humidity very close to 50 per cent at all times, the optimum for wooden instruments; and the VCM

Below: The crated musical instruments from the ROM arrive safely at Vancouver airport.



kindly agreed to accept the Toronto instruments in the spring of 1980, well in advance of the exhibition, and to keep them until the spring of 1982, when the ROM's new environmentally controlled storage would be ready. The loan request received Conservation approval, and once approval from other Museum offices had been received, the preparation of the instruments for their trip could begin. The problem was to maintain a stable 50 per cent relative humidity for the instruments in the ROM's old building while the repairs were made before shipment to Vancouver.

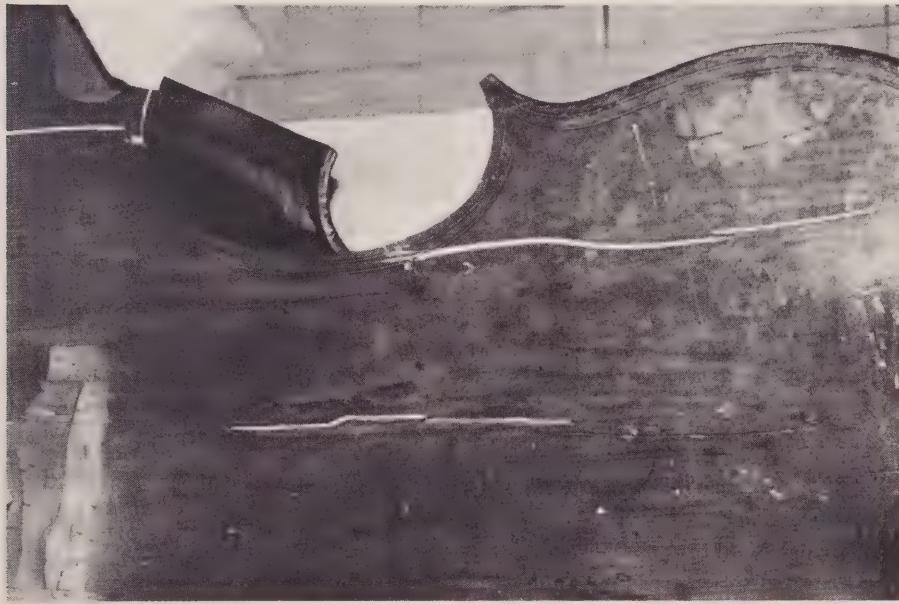
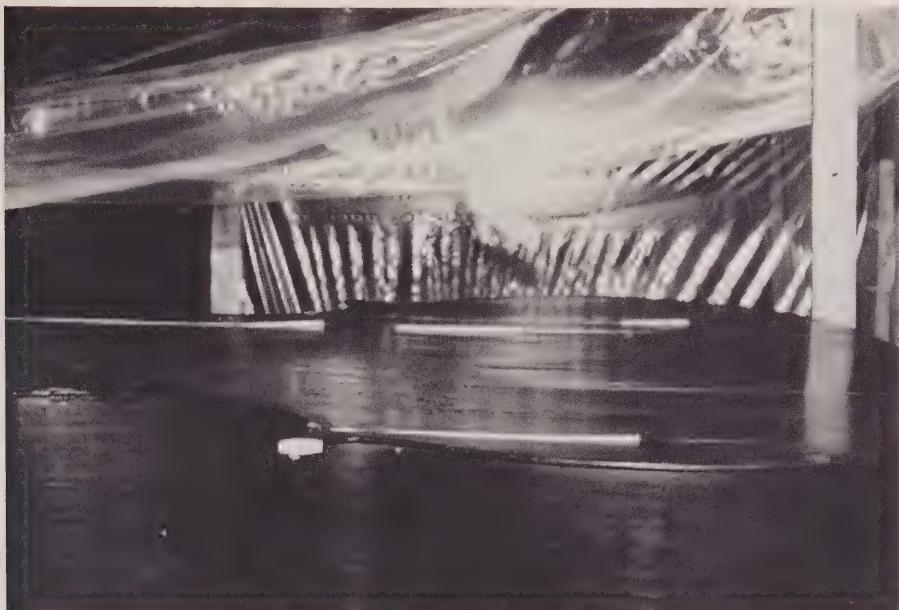
Wood is hygroscopic, that is, it absorbs or gives off water vapour as the relative humidity (RH) around it increases or decreases. As it does so, it changes in dimension across the grain—in general, the thinner the wood, the faster the change. This is why stable relative humidity is essential to the wellbeing of wooden artifacts.

Wooden musical instruments are supreme demonstrations of man's skill as a craftsman, but the very nature of their construction makes them—particularly the family of stringed instruments—peculiarly susceptible to RH fluctuations. In stringed instruments, the wood of the body is very thin, shaped in complex curves, and put under great stress by the tension of the strings. Given the characteristic behaviour of wood, it is evident why stringed instruments would easily develop splits and why repairs to them would not last if the instruments were housed in an environment of radically and continuously changing relative humidity. As the thin wooden parts would constantly undergo dimensional change, cracks would develop and would open and close. If these cracks were filled, an increase in RH would force out either the fill or the adjacent wood, and a drop in RH would make the fill insufficient to close the gap. It is miraculous that *any* stringed instrument has survived centuries of use or neglect.

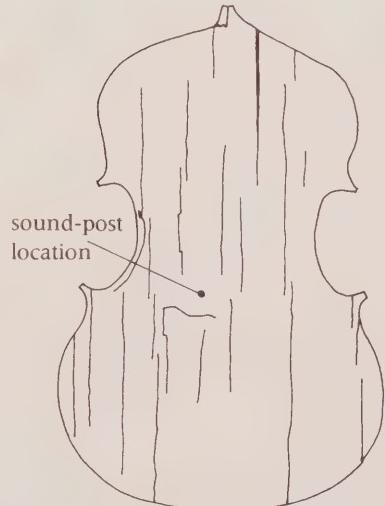
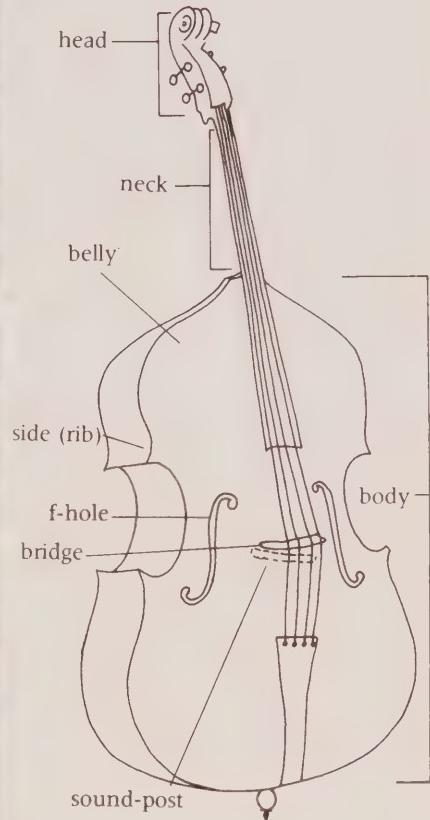
The humidity chamber, or "fish tank".

Although many stringed instruments in the ROM's collection are still in good





Left, top: Wood fills before trimming;
bottom: wood fills before staining and
finishing.



Scale drawing of the splits in the back of
the double bass.

condition, others have suffered over the years. The Gasparo da Salo double bass is one of the less fortunate. Not only does this bass provide an excellent example of the damage encountered in a stringed instrument but also it is the best example of conservation treatment and travel preparations for the loan to Vancouver.

This double bass, the largest of all the strings in the Vancouver exhibition, is a very important instrument in the ROM's collection. It is attributed to the workshop of Gasparo Bartolotti da Salo, one of the earliest makers of stringed instruments. There is a handwritten label inside reading "Gasparo da Salo in Brescia". Gasparo died in 1609 and the instrument dates from about 1600. Apart from this attribution, the instrument is important because all its later history is known (see "The Mirror of Music in the ROM" by Ladislav Cseleky, *Rotunda* 5:3, pp. 16–25). This instrument was once owned by the double bass virtuoso Domenico Dragonetti (1763–1846) who presented it to the Duke of Leinster. The names of both of these men are engraved on the gold-plated brass plate on the peg box. The nephew of the duke sold the bass on his uncle's death to a London firm that sold it to Mr. R. S. Williams. The instrument came to the ROM



The back of the double bass after conservation treatment.

in 1919 as part of a generous gift to the Museum of Mr. Williams's collection of sheet music, letters, and instruments.

The bass was in a very frail state. Although the neck and head were in good condition and the belly, apart from losses at the corners, was structurally sound, the softwood back was another matter. It was marred by 24 large splits, opening as wide as 0.35 cm. The sides of the body (ribs) also had many gaping cracks. Furthermore, what appeared to be a new piece of half-inch dowelling had, at some time, been inserted as the sound-post inside the body between back and belly. Whether the sides of the instrument had shrunk sufficiently across the grain to reduce its depth from front to back or whether, as is more likely, this sound-post was too long or was misplaced in the instrument is not known, but the result had been disastrous. The sound-post had caused a large bulge in the back of the bass and had thrown the opposite edges of the many cracks in its vicinity out of alignment. It was evident that some of the gaping splits of the sides would close if the long sound-post were not holding them open.

I began the treatment of the double bass by building a large chamber of polyethylene sheeting with a wood frame on top of a workbench. One end of this structure extended about 30 cm beyond the end of the bench and a humidifier was placed under the overhang. It was now a makeshift humidity chamber which, because of the pun on the word "bass", became known as the "fish tank". Blocks of wood and ethafoam were cut to hold the big instrument on its belly in the chamber. The relative humidity was kept between 40 and 45 per cent for the first two and a half weeks while a preliminary examination of the piece was made and the wood swelled.

Because the sound-post impaired the structural integrity of the bass, it was necessary to remove it, at least for the trip to Vancouver. However, conservators must preserve as much of the artifact as possible. Before the sound-post

was removed, therefore, its exact location was recorded by measurements and photographs, and once removed, it was carefully labelled and stored. Immediately after its removal many of the cracks in the back fell into alignment, the dimensions of the sides decreased by 0.4 cm, and many of the sides' splits closed. A board was clamped over the bulge in the back and the pressure of the clamps was gradually increased over the next two and a half weeks. During this time, the relative humidity was increased to 60–65 per cent and maintained at that level. After about one week the dimensions of the splits had stabilized. Although the bulge had diminished in this period, the treatment was stopped for fear that too much pressure might cause further damage, and because of another kind of pressure—the shortage of time.

The next stage in the process of repair was the filling of the cracks. Thin shims of cedar were cut to the exact length and taper of the openings. Whenever possible, only one side of each shim was glued. Thus, if the wood were to shrink in a lower relative humidity, the cracks would open easily where there was no glue and no new ones would occur. Also, these fills could easily be removed if necessary without damage to the original wood. Only where the sides of a crack were not flush was animal glue used on both sides of the shim in order to straighten the alignment. When the glue was dry, I trimmed the cedar shims flush with the original wood and stained and finished them to match. I deliberately left the smallest cracks unfilled just in case the instrument was exposed to a relative humidity even higher than the 60 per cent in which it was then housed. All this work was done in the plastic fish tank while the static electricity constantly and malevolently lifted my hair and wood shavings. When the other repairs were complete, including the insertion of a new, shorter sound-post, the relative humidity was slowly lowered to 50 per cent and I held my breath. There were no perceptible changes in the dimensions of the wood or of the new repairs.

The preparators put the plastic-wrapped bass in its crate.



Right: There were 22 crates needed to ship the instruments to Vancouver. Twelve are seen here temporarily stored in the Bishop White gallery, which had been closed for renovations in January 1980.

Below: In the French baroque period room, the bass is put in its protective cotton bag by the preparators. The bass had been stored here after treatment because this gallery space was environmentally controlled.



The commemorative postage stamp showing the ROM's mandora.



In addition to the double bass, the Vancouver loan included many other large instruments—two square pianos, a harpsichord, a spinet, a tuba, and a 203-centimetre-long one-stringed tromba marina. In view of the delicacy of the instruments and the rigours of the trip, each instrument had to be meticulously packed. Because the double bass is so large and awkward, the cheapest and safest packing material for it was small, expanded polystyrene chips. In an effort to keep the ambient moisture level stable and to keep the small chips from falling into the body of the bass through the f-holes, the bass was wrapped in plastic sheeting before being put in its crate. As a drop in temperature could cause condensation within the plastic package, I made two protective cotton bags, fondly referred to as pyjamas, one for the neck and the other for the body of the bass. If the bass had been slid into its sack, the mends on its back might have snagged in the fabric. To prevent such damage, the larger bag was custom-fitted to the bass's body, and a large opening, closed by Velcro tape, was let in down one side of the top. Pyjamas were also made for a chittarone, the theorbo, and the tromba marina which were also packed in the chips. The skilful custom-cutting of thick styrofoam sheets in which most instruments were packed and the packing itself were, as always, done by the preparators.

The musical instruments, accompanied by a conservator, were flown to Vancouver in May 1980. They all arrived safely and made a substantial contribution to a fine exhibition, the largest of its kind ever held. The ROM made another contribution in connection with the exhibition. A commemorative postage stamp, issued on 19 January 1981, to honour this exhibit and antique musical instruments shows the Museum's 18th-century mandora.

The instruments are in Vancouver until April 1982 when they will be returned to their environmentally controlled storage in the new Curatorial Centre to await the preparation of the new display of European musical instruments.



Susan Wilson joined the ROM Conservation Department in 1974 after receiving her Master of Art Conservation from New York State University. She had previously completed a Bachelor of Arts and a Master of Museum Studies at the University of Toronto. In her spare time, she plays the stereo enthusiastically, the piano badly, and the tromba marina infrequently.

Photos: Susan Wilson, ROM, except p. 20-21, ROM Photography Dept., and p. 27, right, Alice Chrysler, ROM

THE · GROWING · COLLECTIONS



Two important portraits recently acquired by the Canadiana Department depict a family that was intimately involved with the American Revolution and the founding of the Province of Upper Canada.

William Jarvis (1756–1817) of Connecticut served with the Queen's Rangers in the American Revolution. A Loyalist, he moved to England in 1783 and in 1785 married Hannah Delvena Peters. Hannah's father was Reverend Samuel Peters, a graduate of Yale University and rector of Hebron Church, Connecticut, from 1759 to 1774, when he too fled to England because of his Tory sympathies. William and his family came to Canada in 1792 at the request of Lieutenant Governor Simcoe and served as the first Secretary of Upper Canada and as Registrar of Deeds. The three children portrayed were born in England; Samuel Peters in 1787, Maria Lavinia in 1788, and Augusta Honoria in 1790. The son, so touchingly depicted wearing a miniature version of his father's Queen's Rangers uniform, died in 1792 shortly after the family's arrival in Canada. It was the second son, also named Samuel, who developed the family property and created the Toronto thoroughfare that commemorates the Jarvis name.

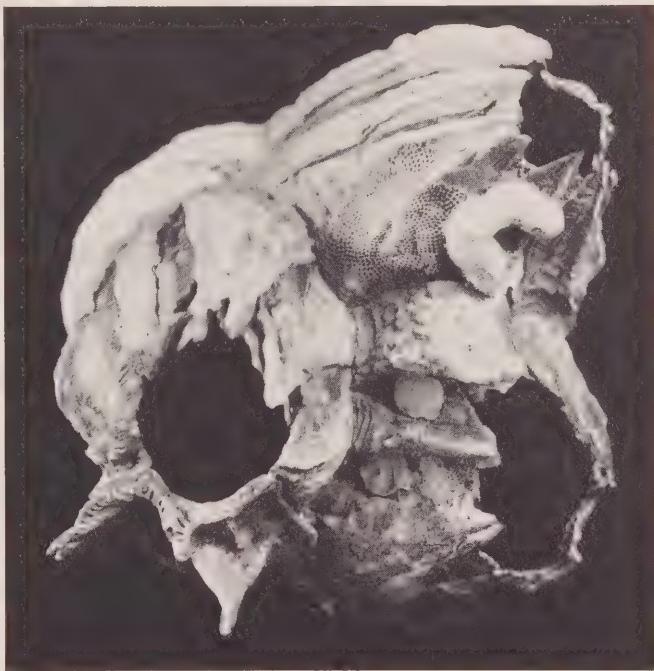
Judging by the ages of the children, the portraits must have been painted in 1791 or early 1792. The unsigned paintings have been tentatively attributed to Matthew William Peters, a member of the British Royal Academy. The portraits were acquired through the assistance of a grant approved by the Minister of Communications, Francis Fox, under the Canadian Cultural Property Export and Import Act.

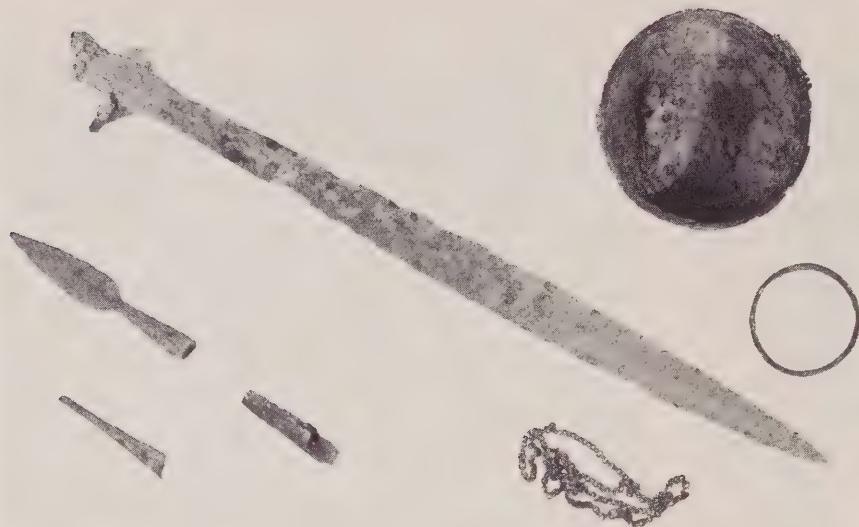
M.A.

The Department of Invertebrate Palaeontology has recently acquired several fossils displaying commensalism—a mutually beneficial relationship between two or more organisms, usually to share a food source. One, from the Mississippian Ramp Creek Limestone of Indian Creek, Indiana shows the brittle star *Onychaster flexilis* entwined about the crown of the crinoid *Actinocrinites gibsoni*. The brittle star fed on the excrement of the crinoid. Being a mobile animal, it could presumably move to another host if it wished (right).

A different type of relationship is exhibited by a specimen from the Pliocene Yorktown Formation of Hampton, Virginia. Here a cluster of barnacles, *Balanus concavus* (below, left), has grown on a slipper shell, *Crepidula* sp. Inside the slipper shell is an encrustation of bryozoans, indicating that the snail was dead before the barnacles grew on its shell. The barnacles themselves have served as attachment sites for other small barnacles (the small radiating discs), as well as three species of bryozoans (the lacy structures) and a serpulid worm (below, right). The smaller encrusting animals took advantage of the hard surface provided by the larger barnacles and also benefited from the currents set up by the barnacles in feeding. In this type of passive commensalism, neither the host nor the associated organisms could move once the relationship was established.

J.W.





The Greek and Roman Department has acquired from a Toronto resident a collection of pre-Roman grave groups from a site in southern Abruzzo, Italy—a region associated with the ancient Samnites and not previously represented in the ROM's collections. Nine items came from a warrior's grave (illustrated); they include an iron sword and spearheads (new to our collections), a bronze bowl, and crude wheel-made pots. Another grave, that of a woman, contained an iron fibula, a set of glass-paste beads, and various ornaments. The graves date from the 6th to the 4th century B.C.

J.W.H.



Photos: p. 28, Bill Robertson, ROM; p. 29, D. M. Rudkin, ROM; p. 30, Brian Boyle, ROM

Almost 500 specimens have been registered into the mineral collection since our last report. About 30 are species not previously represented in the collection and most of these are recently described minerals. Most were purchased from dealers in rare species, a few were presented to the Museum, and a few were acquired by exchange with other institutions.

The most spectacular of the recent acquisitions is a magnificent rosette of catapleiite crystals (illustrated). This specimen measures about 7 cm by 6.5 cm by 1.5 cm thick. The catapleiite is a light brown in colour with some iridescence and the rosette is almost perfect. Catapleiite is a hydrated zirconium silicate that forms hexagonal crystals. Minor amounts of albite, ancyllite, and aegirine are present on this specimen. From the Bernard Baudin collection, this specimen was personally collected by M. Baudin in Mont St-Hilaire, Rouville County, Québec. The ROM purchased this exceptional rosette, one of the five or six finest specimens of this species known, with funds from the Director's discretionary account which is earmarked for exceptional acquisitions.

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NIKE

Sparkling Heritage

The John and Mary Yaremko Collection of Canadian Glass

Janet Holmes



Goblet, pressed colourless glass in the Beaver Band pattern, lettered on foot: *St. Jean Baptiste. 24 juin 1880. Quebec.* It was produced for a special homecoming to Quebec City held that year in conjunction with the religious services and parade of St. John the Baptist Day.

Most of the great museums of the world began as private collections. The ROM's collections too, owe a great debt to private collectors. The Canadiana Department, in particular, was created to house and exhibit a superb collection of 18th- and 19th-century oil paintings, watercolours, drawings, and prints assembled by one man, Dr. Sigmund Samuel. Dr. Samuel's passionate interest in Canadian history led him to collect portraits of kings, generals, administrators, politicians, and explorers who had had a role in Canada's growth; and also views of the country, its towns, garrisons, rivers, roads, and proud moments of history. Since 1951 that first focus on Canadian pictorial history has expanded, and ROM collections now include the decorative arts of furniture, silver, ceramics, woodcarving, and glass. In the formation of all these collections, the interest and generosity of private collectors have played a crucial role.

The first public collection of Canadian glass was established in 1953. An early common interest in documenting the Canadian glassmaking industry and collecting examples of its wares led to the friendship and collaboration of Edith Chown Pierce and Gerald Stevens. In 1953 Dr. Lorne Pierce, in memory of his wife, and Mr. Stevens gave glass from their collections to the ROM to form the Edith Chown Pierce-Gerald Stevens Collection of Early Canadian Glass. In 1965 the Dominion Glass Co. of Montreal, a company that traces its history back to 1880 and has had a central part in Canadian glass manufacturing, launched its own project for celebrating Canada's centennial in 1967. It engaged Gerald Stevens, with the assistance of Dominion Glass employees, to assemble information and examples of early glass production. The information sheets and collection were then presented to the ROM and now form the Dominion Glass Centennial Research Foundation Collection, which includes some 280 items.

Recently, in 1980 and 1981, John Yaremko presented to the Museum the John and Mary Yaremko Collection of Canadian Glass, an important gift of more than 1100 items which more than doubles our earlier holdings. The major portion of the collection consists of 609 pieces of Canadian pressed-glass tableware. In addition there are 168 pieces of American pressed-glass tableware, 20 pieces of mould-blown tableware, 49 lamps, 33 whimsies and commercial souvenirs, 68 pieces of Canadian signed cut glass, and 94 jars and bottles, all from the period 1875-1930.

This collection has been more than twenty-five years in the making. Visits to country auctions and antique shops were sandwiched into Mr. Yaremko's busy schedule of public service as cabinet minister and, later, solicitor-general



Butter dish and cover, pressed white opal glass in the Maple Leaf pattern. Diamond Glass Co., Montreal, 1902.



Bowl with peg foot, pressed amber glass in the Daisy-and-Depressed-Button or Queen pattern, mounted in a silver-plated stand. McKee & Bros. Jeanette, Pa., ca. 1894.

in the Ontario government. In the foreword to Gerald Stevens' book *Canadian Glass, ca. 1825–1925* (Ryerson Press, 1967), Mr. Yaremko wrote about his awakening interest in collecting:

It was in the summer of 1958 that a very happy coincidence occurred in the lives of my wife and myself. An attendance at a village auction (casually stumbled onto, but vigorously participated in) where, of all things, a veritable museum was being dispersed, took place concurrently with the purchase of Gerald Stevens' 1954 *The Old Stone House* and (more significantly) the 1955 edition of *In a Canadian Attic* and the 1956 edition of *The Canadian Collector*—all three at one time! Thus began our private pursuit (much too limited in time and geography) which has combined the almost feverish excitement of the hunt with the satisfaction of accomplishing something very worthwhile. . . .

I became thereby a devotee, and I know of no stronger word, to the collecting of Canadiana in general and glass in particular. . . .

. . . I have set a cardinal rule for myself, "Never buy anything you don't enjoy looking at." Fortunately, in the field of glass collecting there is little that does not for me meet this description.

From that first auction the hunt was on for a piece of glass patterned with that most Canadian motif, the maple leaf. It was Mrs. Yaremko who found the first piece, and with its acquisition collecting had begun. By 1980 a major collection had been assembled. Mr. and Mrs. Yaremko have long been friends of the Canadiana gallery. In 1963, in his excitement at finding the first piece of Maple Leaf pattern in a white opal glass butter dish, Mr. Yaremko presented it for safekeeping in the Museum. From 1969 to 1978 thirty pieces of the Yaremko glass were on display at the Canadiana gallery. Now the collection

Bowl, clear lead glass, cut in the Primrose pattern. Acid-etched trademark of Old English R flanked by rampant lions. Roden Brothers Ltd., Toronto, ca. 1907–1922.



Comport and cover, pressed colourless glass in the Canadian pattern. Attributed to the Burlington Glass Co., Hamilton, Ont., 1874–1897.



has been presented to the ROM for the people of Ontario to enjoy and has been designated as nationally significant by the federal government's Cultural Property Review Board.

Some 900 pieces of Canadian and American tableware and lamps belong to a branch of glassmaking, pressed-glass production, that had been introduced in the United States in the 1820s. By the period of the glass in this collection, improvements in pressing had eliminated earlier problems and production had become mechanized. The skill that gave the object its final form now belonged not to the mechanic but to the designer or mould-maker. The designs of pressed glass continued to imitate the styles of the individually crafted and more expensive cut-glass pieces throughout the 19th and early 20th centuries; but some eighty American and three or four Canadian companies also created hundreds of designs unique to pressed glass, departing from the geometric motifs of cut glass to use designs of flowers, fruits, berries, birds, animals, and classical figures. The collection shows the great variety of forms made: the four-piece set (consisting of a covered sugar bowl, cream pitcher, covered butter dish, and spoon holder), three- and four-inch nappies, seven- and eight-inch comports and covers, plates, relish dishes, etc. The glass itself is a tribute to the high quality of industrial design and execution in this period. It is also a mute witness to the transition from an agricultural and mercantile economy to an industrial one that began in Canada in the last half of the 19th century.



Claret decanter and stopper, clear lead glass, with a large cut Buzz star. This pattern was registered by the Rodens on 22 May 1907. Acid-etched trademark of Old English R flanked by rampant lions. Roden Brothers Ltd., Toronto, ca. 1907–1922.



Above: Goblet, pressed colourless glass in the Rayed Heart pattern. Jefferson Glass Co. (Dominion Glass Co.), Toronto, 1913–1925. The pattern imitates a cut-glass pattern introduced about 1907. Made only for a few years, the goblet is now relatively rare.

Right: Lamp, pressed emerald-green glass foot and mould-blown emerald-green glass font. Diamond Glass Co., Montreal, 1902.



In the Canadian pressed glass about twenty-seven patterns are represented, distributed fairly evenly through the period 1880–1930; the collection thus provides a fine survey of glass patterns made by the major Canadian producers. It also shows the changing styles of design. The Gothic, Queen Victoria, Kenlee, Raspberry, Raspberry-and-Shield, Grape-and-Vine, Ribbed Band, Starflower, Tandem Bicycle, and Tassel-and-Crest patterns of the Nova Scotia Glass Co., New Glasgow, N.S. (1881–1892), and the Canadian pattern attributed to the Burlington Glass Co., Hamilton, Ont. (1874–1897) show the finely detailed, low-relief sculptural qualities of glass designed in the 1870s and 1880s in North America. Some patterns have the bolder geometric designs and deeper pressing that became fashionable in the 1890s: the Button-and-Bows and Crown patterns of the Nova Scotia Glass Co., and the Stippled-Swirl-and-Star, Late Nugget, and Maple Leaf introduced by the Diamond Glass Co., Montreal (1890–1902) and continued by its successor companies, Diamond Flint and later Dominion Glass. The more unusual coloured versions of the Maple Leaf four-piece set are represented by sets in white opal, blue opal, and emerald-green glass. The Beaded-Oval-and-Fan pattern, made by the Diamond Flint Glass Co., Montreal (1902–1913), and the Daisy-and-X-Band, Oval-and-Fan Number 2, Rayed Heart, and Thistle patterns of the Jefferson Glass Co., Toronto (1913–1925) show the continued imitation of the ever more elaborate cut-glass designs. By the early 20th century cut-glass pieces often combined several different geometric motifs with four or five different cutting styles, producing a profusion of ornament.

The American pressed glass in the collection complements the Canadian and together they demonstrate the range of North American glass of this period. Both industries attempted to capture the growing market by introducing new designs each year. Among the American patterns are examples of Deer-and-Pine, American Maple Leaf, and Wheat Sheaf, all patterns of the 1870s; Cord-and-Tassel, made by Central Glass Co., Wheeling, W.Va., 1872; Panelled Wheat, by Hobbs, Brockunier and Co., Pittsburgh, ca. 1881; and the Sunflower pattern, by Atterbury Co., Pittsburgh, 1881. The stylistic change in the new patterns of the 1890s is well represented by the Daisy Chain and Chandelier-and-Diamond-Medallion patterns; the Daisy-and-Crossbar, by Richard and Hartley Co., Tarentum, Pa., ca. 1888; Pointed Bull's-Eye, made by Dalzell, Gilmore and Leighton, Findlay, Ohio, ca. 1892; Sunken Bull's-Eye, made by Cooperative Flint Glass Co., Beaver Falls, Pa., 1894; and the Daisy-and-Depressed-Button pattern, made by McKee Bros., Jeanette, Pa., 1899.

One set of tableware is unusual in that the pieces have been mould-blown rather than pressed. It is the Cosmos pattern white opal glass set which includes both a large and a miniature lamp, a four-piece table set, a three-bottle cruet set and stand, a syrup jar, a large pitcher, tumblers, a pickle jar, and salt shakers. Only the butter-dish base and applied finials on the butter-dish and sugar-bowl covers have been pressed. The edges of the pieces have been finished by grinding, an extra step adding to the cost of the finished article.

By far the largest number of lamps, twenty-four of the forty-nine, are in the Bull's-Eye pattern. These were advertised for sale in 1902 by the Diamond Glass Co. of Montreal and were offered in four different sizes, as well as in a hand lamp and a footed hand lamp. They could be ordered with an opal foot for 25 per cent extra and with an emerald foot for 10 per cent extra. These lamps made of two colours of glass are rarer pieces because the uniting of two glasses with different cooling rates was a highly skilled operation. It is likely that this variety of coloured lamp was produced in the late 19th century and on into the early years of the 20th century. The plain stem variant, occurring only in clear glass in the collection, and probably not produced in colours, may simply be a later production from different moulds, perhaps from the Dominion Glass Co. about 1915–1930.

Although for a museum collection it is usually possible to acquire only one example of each pattern to form a representative collection, for an extensive private collection a number of different forms in one pattern may be assembled. Comparison of pieces can show variants in patterns and an examination



Lemonade jug, clear lead glass, cut in the Norman pattern. The dentillated edge and interlocking hexagon were registered on 9 November 1910. Roden Brothers Ltd., Toronto, 1910.



Above: Open compot, pressed colourless glass in the Diamond Ray or Pillar-and-Diamond pattern. Nova Scotia Glass Co., New Glasgow, N.S., 1881–1892.

Top, right: Pitcher, clear lead glass cut with a diamond and Maple Leaf pattern. The Maple Leaf pattern was registered on 11 April 1913. Acid-etched trademark of cloverleaf lettered *G C Co* on the thumb-rest. Gundy-Clapperton Co. Ltd., Toronto, 1905–1920.



of pieces produced in the same mould can reveal information not available by any other process. This is an area in which collectors have an advantage over museums. Glasfax, a national collectors' group, has launched a survey of the different forms of Canadian glass patterns in members' collections, but the results of the survey are not yet complete.

In each pattern collected, Mr. Yaremko has attempted to assemble as many of the different forms as possible, especially in his own favourite patterns—Maple Leaf, Canadian, and Tassel-and-Crest. Some of these variants have provided a rich source of information, and some have raised questions that cannot yet be answered. The Maple Leaf footed bowl is a pattern of which the collection contains several variants. One of the variants has concentric circles in the base of the bowl; when the pattern impression from this mould became

rather indistinct through long use, a new version replaced it. Another interesting pattern is the Queen Victoria pattern made by the Nova Scotia Glass Co. of New Glasgow. On some forms the pattern bears a profile portrait of the young queen and the dates 1837 and 1887. The line was probably introduced in celebration of the 50th year of Victoria's reign. Variants of the pattern using the same moulds show a profile of the older queen superimposed on that of the younger, and the dates have been replaced by the word *Jubilee*. This version would have been a reissue of a popular pattern to celebrate the Diamond Jubilee in 1897. By that date the original manufacturer had been purchased and then closed in 1892 by the Diamond Glass Co., Montreal. The source of this later issue from altered moulds is probably this firm. Where there are no surviving illustrated catalogues and no company records, examination of such variants can thus be very revealing.

One of the very special parts of the gift is the collection of 68 pieces of cut glass bearing the acid-etched trademarks of the four major Toronto firms that made cut glass between 1900 and 1930. In Canada this technique of glass-making began with the work of Joseph Egginton in Montreal in the 1870s, but the industry did not really develop until the 20th century. Because European cut glass was the most popular, American glass was often marketed as European. In the 1890s American cut-glass firms began a promotion of their products as American Rich Cut Glass. Only after the popular acceptance of American cut glass did the Canadian industry develop. With the establishment of Roden Bros., Toronto (ca. 1907–1922); Gowans, Kent, Ltd., Toronto (ca. 1900–1918); Gundy-Clapperton, Toronto (1905–1920) and its successor, Clapperton Ltd. (1920–1974); and George Phillips, Montreal (ca. 1905–1970), the art of glass-cutting flourished. These were the most important companies, but when the demand for elaborately patterned and brilliantly reflective cut glass was greatest, there were other smaller cutting shops, perhaps twenty or thirty, located in Ontario, Quebec, and the West. These disappeared in the late 1920s when fashion turned to more delicate or simple designs.

The cut-glass pieces in the collection all display the high degree of skill of their craftsmen. They illustrate the various styles of design—from the geometric patterns of the Buzz Star and the Hob Star to the more shallow cutting of flowers in the Primrose bowl and the Maple Leaf design water pitcher. One piece of great teaching value is a partially cut bowl that shows the plain blank glass and the first deep cuts of the "rougher", who set the deep cut lines of the pattern before passing the work on to a "smoother", who added the more shallow-cut pattern details, and then to a "finisher", who polished the piece.

The collection of 94 bottles and jars also supplements the ROM's similar collection of bottles manufactured for Quebec merchants. This new addition concentrates on Ontario wares, and includes some of the earliest bottles and jars made by the Hamilton Glass Co., Hamilton (1865–1898) and a rare amber glass Beaver fruit jar, made by the Ontario Glass Co., Kingsville (1899–1901). Since the complex process of making bottles involved several different hand operations, this part of the glass trade resisted mechanization until the late 1880s, and automatic production until after 1907. The results of some of these technological improvements may be seen in the bottles themselves, and thus the collection forms a valuable record of the technological changes in the industry.

Until now, although our collection was adequate to show the development of the Canadian glass industry in exhibitions in the Canadiana gallery, our reserve collection had enough gaps in it to make any thematic travelling show of Canadian glass impossible. With the addition of this important collection, that is no longer true. In 1983 we hope to show a substantial part of it in exhibition at the ROM, and also to develop several travelling shows through our Extension Services Department. The John and Mary Yaremko Collection of Canadian Glass, a magnificent gift, lovingly assembled by two people, will soon be accessible to many people.

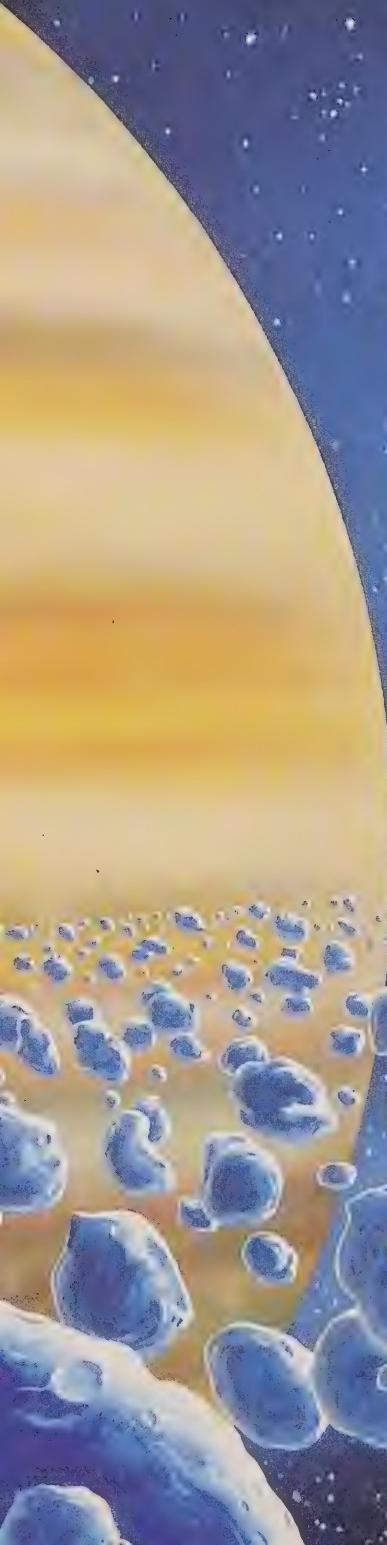


Janet Holmes is a curatorial assistant in the Canadiana Department. She graduated in history and modern languages from the University of Toronto in 1963 and received her B.L.Sc. from McGill University in 1965. Her primary fields are the history of glass technology, the development of the Canadian glass industry, and Canadian toys. Miss Holmes contributed the chapters "Glass and the Glass Industry" and "Toys and Games" to *The Book of Canadian Antiques*, edited by D. B. Webster and published by McGraw-Hill Ryerson in 1974.

Photos: Brian Boyle, ROM, except p. 39, Bill Robertson, ROM

Ringed World

Speculations on a Ring Around the Earth



During 1980 and 1981, unmanned robot spacecraft beamed back to Earth thousands of dazzling views of the planet Saturn, its family of moons, and its magnificent system of rings. These missions were the culmination of more than three and a half centuries of curiosity, for Saturn has fascinated all who have gazed upon its ringed countenance.

Until the late 1970s Saturn's marvellous rings were believed to be unique. On 10 March 1977, however, astronomers accidentally discovered a series of narrow rocky ringlets in orbit around Uranus. Two years later the spacecraft Voyager 1 photographed a previously undetected ring of particles surrounding the giant planet Jupiter. There has even been some speculation that Neptune also is ringed, but recent observations have cast doubt on that idea. This sudden increase in the popularity of ringed worlds has naturally led to questions about our own planet. Might Earth have once possessed a necklace of ice or rock similar to those currently gracing three other worlds?

One of the earliest Earth-ring proposals was presented in 1940, when Dr. R. L. Ives suggested that a ring of minute satellites, formed by the breakup of a small second moon of Earth, which he dubbed "Ephemeron", orbited above the Earth's equator some 270 million years ago. Dr. Ives argued that the ring's shadow on Earth's equatorial areas resulted in the onset of the Permian ice age. His theory was not well received, being labelled by one scholar as "a sort of *deus ex machina* on a flying visit".

But Ives may have been just slightly ahead of his time. Recently, the idea of a climate-altering ring has been revised and modified by Dr. John O'Keefe, a planetary theorist working at the Goddard Space Flight Center in Maryland. O'Keefe suggests that 34 million years ago, at the end of the Eocene Epoch, a thin disc of particles formed above the Earth's equator. During its lifetime of one to two million years, the ring alternately shaded the northern and southern

Paul Deans

Opposite page: Artist's conception of a close encounter with a ringed planet.
Artwork by John Lightfoot.

Below: Saturn from Voyager 1. The planet is overexposed in order to bring out detail in the rings. Courtesy of NASA/JPL.



Depiction of the Voyage 2 flyby of Uranus in 1986. Astronomers are uncertain as to the actual appearance of the rings. Courtesy of NASA/JPL.



hemispheres, causing a dramatic change in the Earth's climate. Is such a scenario plausible? Where might such a ring have come from, and why would its lifetime be so short? What clues could exist in the fossil record that might hint at the presence of an Earth-ring?

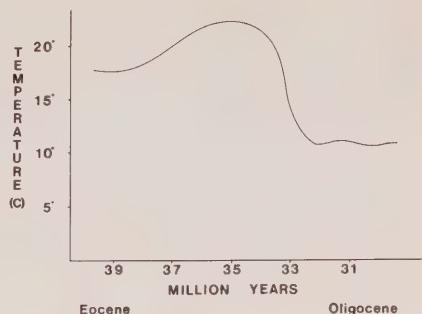
Imagine, for a moment, that the Earth is suddenly enveloped by a cloud of rocky debris. Such a cloud would be unstable because collisions between the particles and the constant gravitational tug exerted by the Earth would result in ever-changing orbits for each member of the rocky swarm. So, according to current theories of ring formation, the cloud of particles would rapidly collapse into a thin, flat, spinning disc. This disc would settle in the most gravitationally stable spot—directly over the Earth's equator. Because the Earth's axis is tilted $23\frac{1}{2}$ degrees, the shadow would alternately cover the northern and southern hemispheres; each hemisphere would be shaded only during its winter months. For example, during the summer in the northern hemisphere, the sun is high in

the sky, and would be well north of the ring stretching out from the equator; during the winter when the sun is south of the equatorial plane, its light would be intercepted by the ring. The strength of the shadow cast by this hypothetical ring would depend upon the density of the particles within the disc. As much as one third of the total solar energy that normally reaches the winter hemisphere might be deflected. Consequently, the winters would become even colder, the difference between the average summer and winter temperatures would increase, and the overall average global temperature would decline.

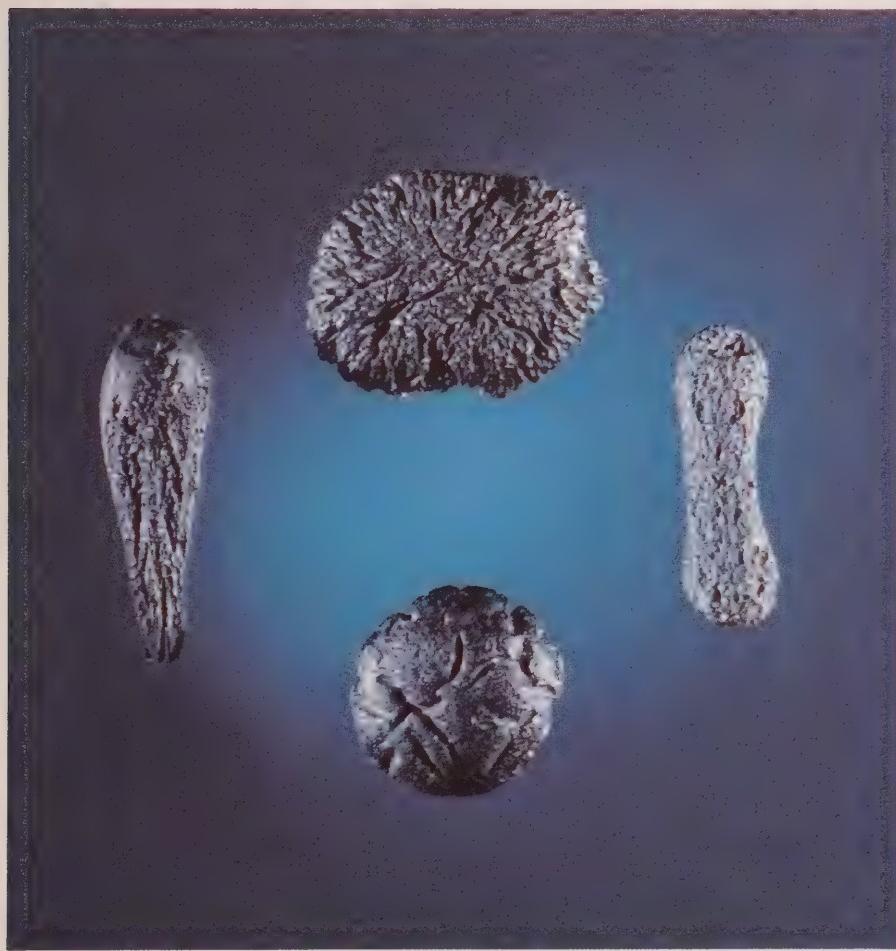
Given the consequences to Earth's climate if a ring ever appeared, is there any evidence for a ring in the fossil record? Until recently the answer was thought to be no, because the climatic changes postulated by this theory would occur over only a million years—a very short time-span, geologically speaking. The problem was that most methods of climate analysis show only long-term trends, not short-term fluctuations.

However, Dr. Jack Wolfe of the U.S. Geological Survey, using a new and still controversial technique, believes he can detect rapid variations in climate in the far-distant past. Wolfe has been looking at possible correlations between the shapes and sizes of different leaves and the environment in which they grow. In particular, he argues that the edges (or margins) of living and fossil leaves are good indicators of climate. For example, Wolfe found that within a tropical rainforest, with an average annual temperature of 27°C and an annual range of temperatures between 1°C and 5°C , more than 75 per cent of the leaves are large with smooth edges. In cooler climates with a larger temperature range, small leaves with incised or "sawtooth" edges predominate.

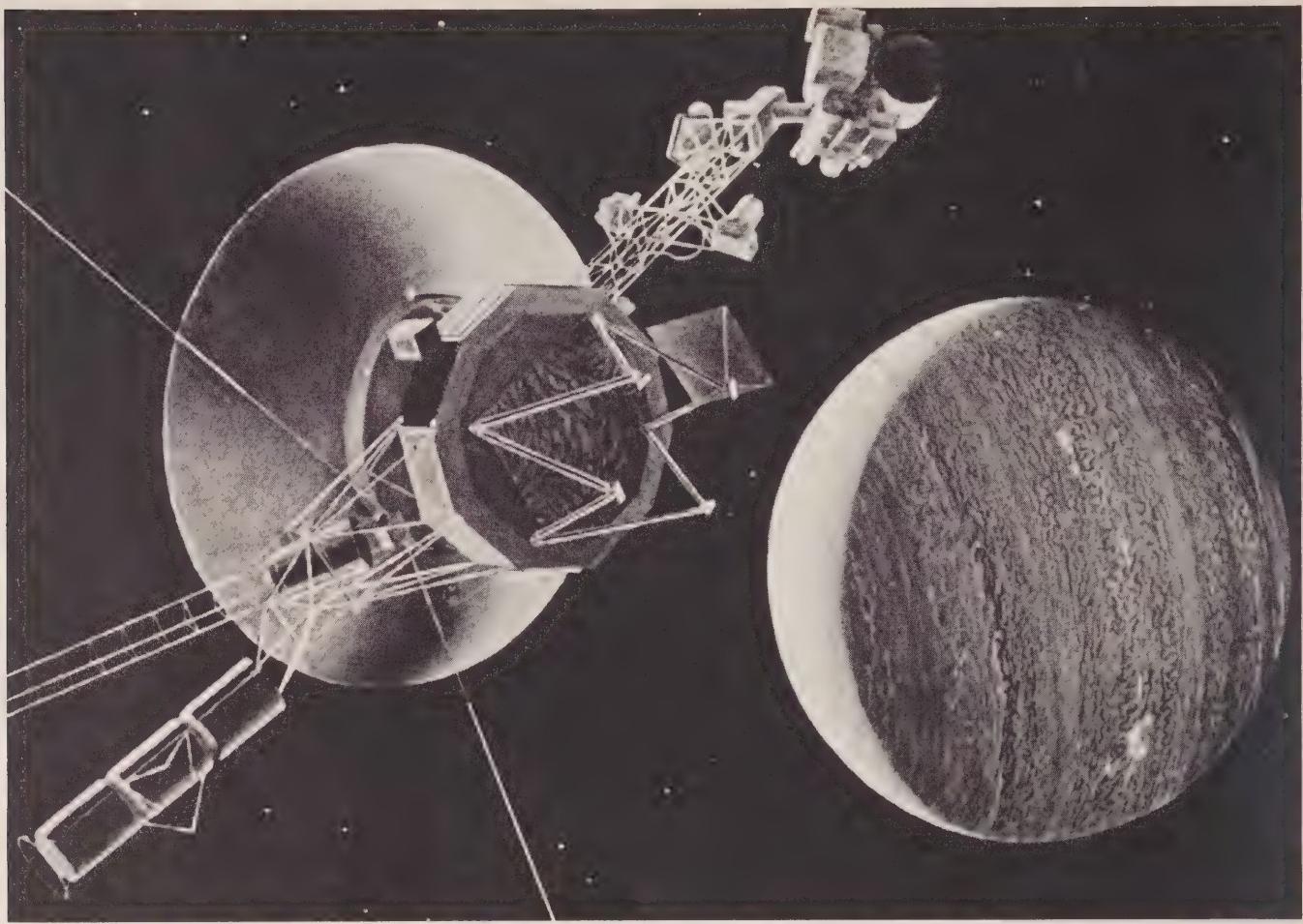
In order to apply this idea to ancient climates, a large assortment of accurately dated fossils was required. Dr. Wolfe examined a series of fossil leaves from Alaska, Oregon, and California that dated from the Eocene and Oligocene



Average temperature in the northern hemisphere as deduced from leaf data by Jack Wolfe. Adapted from "A Paleobotanical Interpretation of Tertiary Climates in the Northern Hemisphere" by Jack A. Wolfe in *American Scientist*, vol. 66.



Examples of tektites that fell over Australasia 700 000 years ago. Photo: Chris Sasaki, ROM.



Voyager 2 and Neptune in 1989. Will the spacecraft discover a thin ring surrounding this gas giant planet?
Courtesy of NASA/JPL.

epochs, 50 to 30 million years ago. This was a time of puzzling climatic changes. During the Eocene most of the world was much warmer than it is today. Tropical and subtropical forests covered the Pacific Northwest, and even in Alaska palms, mangroves, and other tropical plants flourished.

However, by 30 million years ago the entire world had cooled considerably. No completely satisfactory explanation for this change has ever been advanced. Wolfe discovered that the fossil leaves from this period confirmed the overall shift in climate, and revealed that the change was quite rapid. It appears that over a two-million-year period beginning about 34 million years ago, the areas of the Pacific Northwest previously occupied by tropical forests became covered by deciduous forests. The apparent change in leaf structure implied a decline in the average annual temperature of roughly 12°C —from approximately 22°C down to 10°C . The increase in the difference between the average temperatures of summer and winter was even greater. This range, only 5°C during the Eocene, rose to over 20°C during the early Oligocene.

In trying to explain this sudden temperature drop, Dr. Wolfe proposed that the Earth's inclination had changed from only a few degrees to its present $23\frac{1}{2}$ -degree tilt. Such a change is possible; it may even be taking place on the planet Mars. But changes in the axial inclination of a planet are slow, occurring degree by degree over many millions of years. It is unlikely that Earth experienced a rapid enough change in its axial tilt to explain Wolfe's observations. In addition, this idea has the same flaw as other theories advanced to explain the events at the end of the Eocene—none can adequately account for the rapid and extreme increase in the difference between summer and winter average temperatures that Wolfe detected in his leaf data.

The climatic shift of 34 million years ago was not confined to the Pacific

Northwest. It has been documented in Europe, in western Siberia, in New Zealand, and in sediments recovered from the ocean floor, indicating that the change was worldwide. In addition, cores taken from the floor of the Caribbean Sea revealed two more unusual events at the 34-million-year level—the demise of five species of Radiolaria and the simultaneous appearance of a thin layer of tiny glass beads known as tektites.

Radiolaria are micron-sized creatures that dwell in the warmest reaches of Earth's oceans. More than 6000 living and extinct species are known, each possessing a distinctive and delicately beautiful skeleton made of glassy silica. Forty million years ago radiolaria populated vast areas of the eastern Pacific and western Atlantic. Yet the deep-sea cores taken from the Caribbean suggest that 34 million years ago five species, representing two-thirds of the total radiolarian population, vanished. This discovery by Dr. B. P. Glass (and others) at the University of Delaware was actually a byproduct of some unrelated research. Glass was really interested in the detection of micro-tektites in the Caribbean sea-bed cores.

Tektites are strangely sculptured bits of glassy rock that have been described as "probably the most frustrating stones ever found on Earth". In size, they range from a few centimetres down to less than one-hundredth of a millimetre across. They are found only in four widely separated regions—Australasia, the Ivory Coast, Czechoslovakia, and the southeastern United States. Each of these tektite fields is also a different age, from 700 000 years old for the Australasian stones to 34 million years for the North American field. Larger tektites tend to be unusually shaped; many resemble buttons, teardrops, dumb-bells, or convex lenses. The origin of these objects is a mystery—most show definite signs of aerodynamic sculpturing. In other words, their exteriors seem to have been remelted by a high-speed passage through the Earth's atmosphere.

Because of the remelting, the notion that tektites originated beyond the Earth was very appealing, and numerous theories, invoking debris from such possible sources as the destruction of asteroids, impacts on the moon, and lunar vulcanism, have sprung up since the early 1900s. But once the Apollo lunar missions revealed that moon-rocks and tektites were chemically incompatible, many researchers began to argue for a terrestrial origin. It is now thought that tektites may be the result of kilometre-sized rocks striking the Earth. At the moment of impact millions of tonnes of melted rock would be hurled into the upper atmosphere. This tight swarm of matter would follow a suborbital flight path and re-enter the denser portions of the atmosphere down-range from the impact site. With this theory in mind, two craters that may be responsible for the Czechoslovakian and Ivory Coast tektites have been tentatively identified. But some scientists are sceptical of this idea, and the tektite argument remains unresolved.



Close-up of Jupiter's ring edge. Any Earth-ring would probably resemble Jupiter's disc rather than Saturn's broad rings. *Courtesy of NASA/JPL*



Earth of 34 million years ago? *Earth*
photo courtesy of NASA; artwork by Bill
Ireland, ROM.

What do Radiolaria, tektites, and climatic changes have to do with one another? Dr. John O'Keefe has drawn them together to support his contention that 34 million years ago the Earth possessed a miniature version of the magnificent ring of Saturn. O'Keefe argues that the shading effect of an equatorial ring would cause the temperature drop reported by Wolfe. The decline in the total amount of solar energy reaching Earth would also affect the oceans, causing the extinction of marine organisms such as Radiolaria that require warm and constant temperatures to survive. The ring itself might have been composed of tektites shot from active lunar volcanoes. Although some of the matter ejected would fall directly onto the Earth, most of the lunar material would end up in an unstable orbit around the planet. O'Keefe is a firm believer in a lunar origin for tektites, and it was the discoveries by Glass that set him thinking about extinctions and rings.

There are, however, better ways to explain the appearance of a ring. Several planetary theorists have suggested that it would be difficult to produce an Earth-ring from the ejecta of lunar vulcanism; among other things, the eruption would have to be powerful yet short-lived, and the volcano itself would have to be "aimed" toward the Earth. It is much easier to theorize that the Earth acquired a ring in the same manner that other planets acquired theirs—either by the disintegration of a satellite or by the capture of particles from an enveloping cloud of matter.

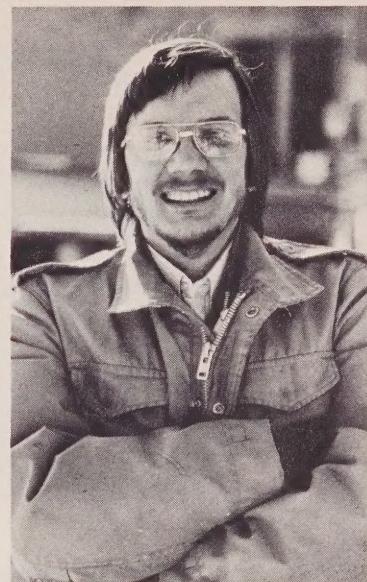
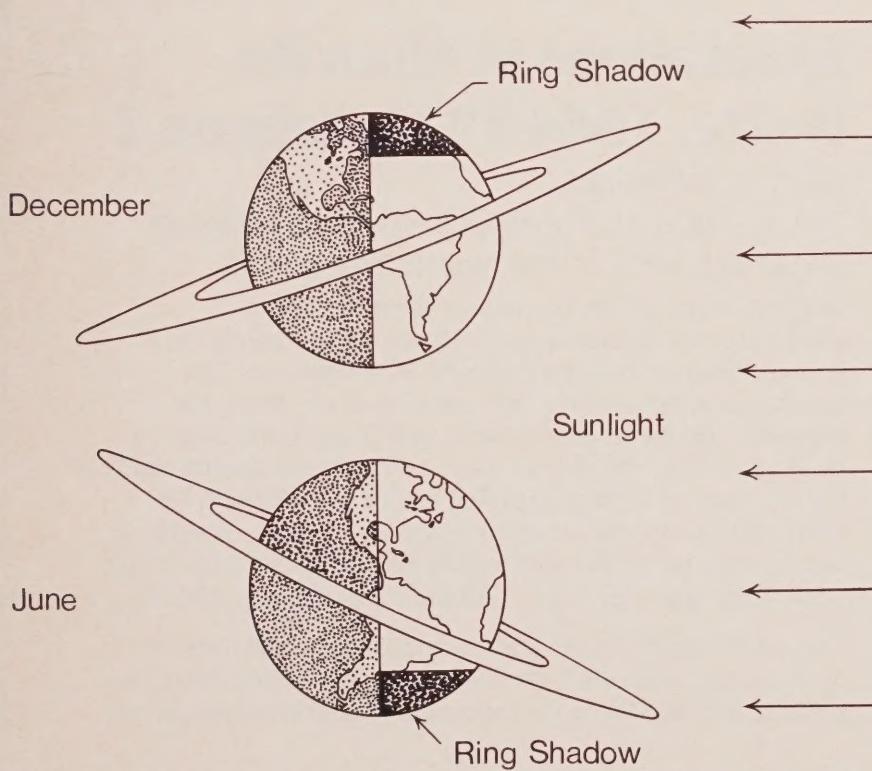
The first idea involves a moon in an unstable orbit that is drawn ever closer to its larger companion. Long before it crashed into the planet's surface, such a moon would be literally pulled to pieces by the gravity of its more massive partner. The debris from this calamity would slowly spread around the planet, eventually forming a thin disc.

The other theory of ring formation, involving the capture of material from a passing dust cloud, may seem a little far-fetched, but it is known that during our sun's 250-million-year journey around the centre of the galaxy it passes close to

and possibly through large interstellar clouds of gas and dust. If the Earth were temporarily enveloped by a swarm of rocky debris, some of the particles would remain in orbit after the cloud passed by. Within only one or two years this cloud of orbiting debris would collapse into a broad thin ring around the Earth. The tektites found scattered across North America might come from cratering produced by the infall of larger chunks of rock from either the disintegrating moon or the cloud of debris.

Once a planet acquires a ring, how can it be removed? After all, most astronomers believe that the rings of Jupiter, Saturn, and Uranus have been present since the birth of the solar system four and a half billion years ago. Theoretical studies now backed up with observations by spacecraft have provided a few clues. Both the Jovian and Saturnian ring systems are held in place by "guardian moons"—satellites that orbit just outside the edge of the ring and gravitationally "push" straying particles back into place. Without similar guardians, an Earth-ring would slowly disintegrate as the particles either drifted off into space or plunged down into the atmosphere. This drift would be accelerated by other forces, some of which have only minor effects upon the ring systems of the giant planets. For example, the solar wind (composed of an assortment of charged particles) is much stronger at Earth than at Jupiter or Saturn and would tend to nudge small Earth-ring particles gently out of orbit. In addition, the gravity of our nearby Moon would be strong enough to destabilize the orbits of all ring particles. The net effect of all these forces would be the destruction of any disc of particles after a lifetime of only a few million years.

The idea that Earth was once a ringed planet is appealing, particularly in light of the Voyager missions to Saturn and Jupiter and the discovery of the Uranian ring system. We have seen that not only are ringed planets beautiful to behold, but they are also more common than previously believed. The appearance of an Earth-ring 34 million years ago nicely fits some new data and solves the long-standing puzzle of the sudden change in climate. But at the moment the data supporting the hypothesis remains weak, and the interpretations of tektites and tree leaf data continue to be controversial. Inconclusive data and controversial interpretations, of course, never stop speculation. Earth would certainly look pretty wreathed by a dazzling necklace of rock bits and ice crystals . . .



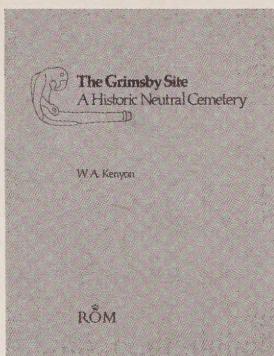
Paul Deans is a graduate of the University of Alberta in Edmonton. While attending university he worked part-time at the Queen Elizabeth Planetarium and became a full-time staff member in 1974. He joined the McLaughlin Planetarium as a producer in May 1980. Recent non-planetarium (but astronomy-related) activities include programming for Telidon (the Canadian videotex system) and preparing a weekly astronomy report called *Heavens Above* for CBC-AM radio.

Photo: Chris Sasaki, ROM

The movement of the ring shadow with the passing of the seasons. The size and position of the ring relative to Earth are not to scale. *Artwork by Bill Ireland, ROM.*



New Books from the ROM

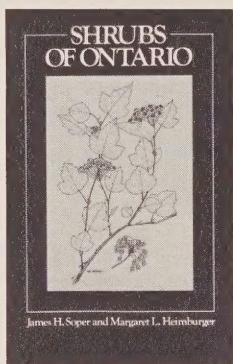


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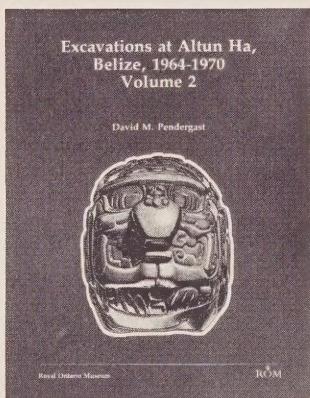


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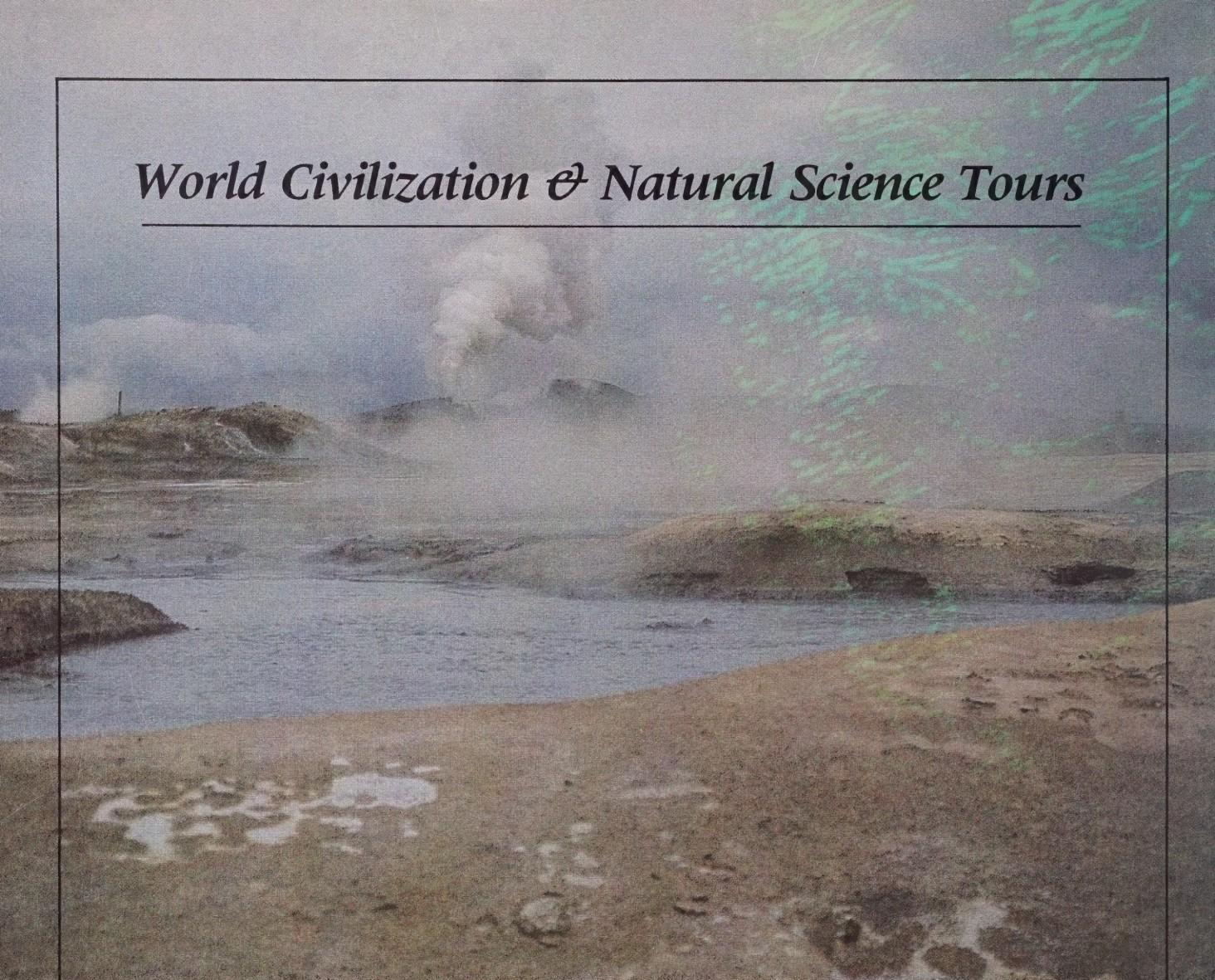
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